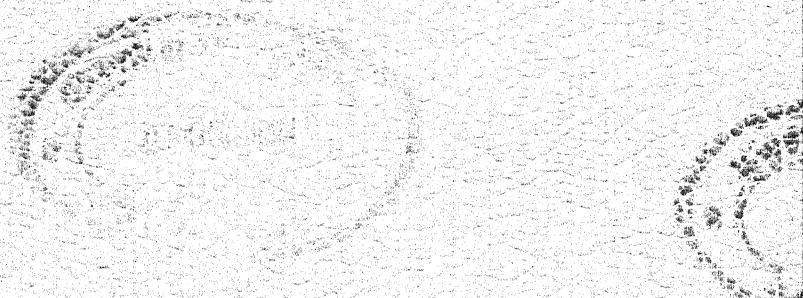
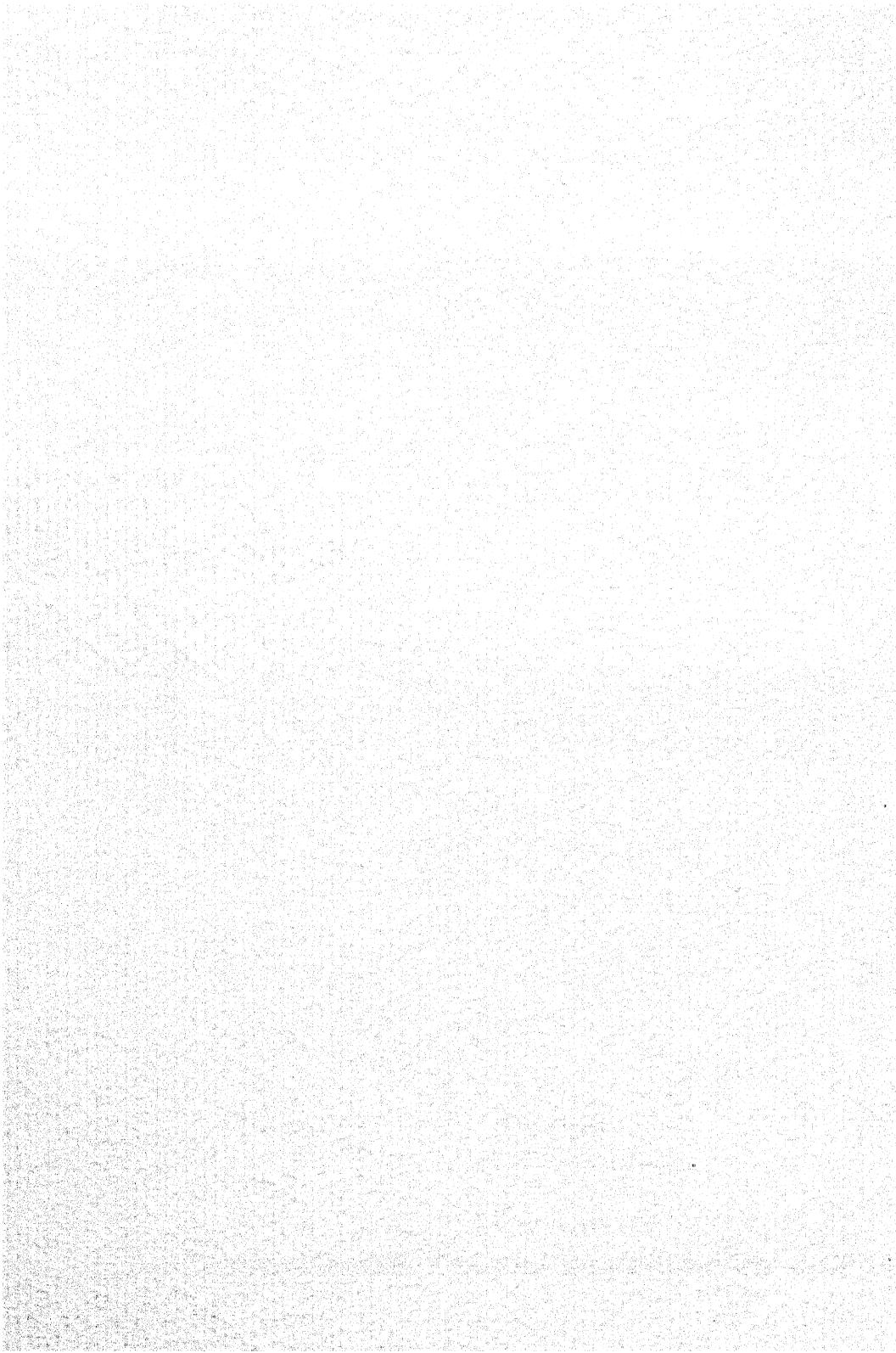


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**TABULAR KEYS**

FOR THE

**IDENTIFICATION  
OF THE  
WOODY PLANTS**





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# TABULAR KEYS

FOR THE

## IDENTIFICATION OF THE WOODY PLANTS

Compiled and arranged by

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## P R E F A C E

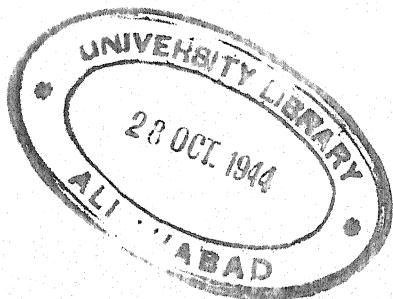
This set of TABULAR KEYS has been evolved for the use of students and others interested in the more used woody plants of the Northern States and Canada—for study and for identification in the field.

It cannot take the place of those more detailed and complete references already available nor is it so intended. It is rather designed for quick reference and comparison and for use in the field. The attempt has been made to eliminate as far as possible the use of instruments such as scalpel and microscope and to lead the student to observe and to identify from external characters.

The Keys include the five hundred trees, shrubs, vines, conifers, and broad-leaved evergreens heretofore described in the card file entitled "USEFUL TREES AND SHRUBS." These Keys supplement and complete that work. But the two can be used separately if desired. Every attempt has been made to verify the characters used and to check them against the work of standard authors. With a few exceptions, the nomenclature follows that of the last edition of the Manual by Alfred Rehder. In the interest of simplicity we have retained one or two names which much usage has seemed to justify and we have preferred to follow recent precedent in discarding the capitalization of species names and the double i ending. Changes from the card file can be noted in the list of names preceding the text.

In offering this set we trust it will prove helpful to students and useful to others.

FLORENCE BELL ROBINSON



## How To Use the Keys

Keys to the *genera* are similar in type to the keys found in all standard works on Botany, but differ from the other keys in the attempt to eliminate the use of scalpel and microscope, also in the addition of a key based on winter buds and twigs. These genera keys are adapted from those arranged by Dr. Trelease and published in "The Native and Naturalized Trees of Illinois." We are indebted to Dr. Trelease and Dr. Tehon for their permission to do this. Data incorporated in the keys has been checked against the works of the following authorities—Gray, Rehder, Bailey, Trelease, as well as in the field. In only a very few instances have we taken the liberty to disagree with any of these authorities.

In using the keys, read all statements labelled A, AA, AAA and decide which one best fits the tree or shrub you are considering. If it belongs under A, then you have eliminated all under AA and AAA and need consider those no further. Similarly for AA or for AAA.

Below A is b and the latter is used twice, i. e. b and bb. Again decide which of the two fits the tree or shrub and then proceed to the next pair of statements, labelled c and cc. Continue this until the last statement leads to the name of a genus. For every positive statement there is a negative—a tree *is* or *is not* of a certain type, it *has* or *has not* a certain character. With that fixed in mind the keys are simple to use and the results you obtain depend only upon the accuracy of your observation and judgment.

Having traced the plant to the name of a genus, turn to the page and genus indicated and check the twig or leaf against the identification characters there stated for winter and for summer. If it fails to check at this point you have made an error and will need to begin over. But if you have been accurate, it will check. It sometimes occurs that one is not certain of some character to be observed, in which case it is necessary to proceed by the process of elimination. Assume the first statement and carry through. If it does not check at the end, go back and try the opposed statement and proceed until you get a positive check.

Continue the identification by means of the *tabular keys to the species*. Begin at column one—again you find a positive and a negative statement, both in column one. If the first statement fits, do not go below the line of the second. If the second statement fits better than the first, then skip everything above that statement. The full identification depends upon a combination of characters, as is clearly shown in this tabular key, and not upon any one characteristic alone. Follow each column through in turn, and decide upon the character that fits in each case. Having decided upon a character, you do not need to consider anything above that line in successive columns. When you have finished, the species of your leaf or twig will check horizontally across the page. The heavy dotted lines assist in tracing down the decisive differences between species. These are drawn solely for the purpose of clarity and have no other significance.

The heavy full lines and doubled lines assist in reading the keys rapidly. Heavy lines divide the species into smaller groups having similar characteristics, and the dotted lines call attention to certain important points of distinction between adjacent species.

Keys for trees, shrubs, vines, conifers, and broad-leaved evergreens are separated. Since each type of plant is thus considered separately it is necessary to decide first of all to which type the plant belongs. If not sure of this, the process of elimination can be used, trying each type in turn until you get a positive check on characteristics.

## KEY TO THE TREES WHEN IN LEAF

A. Leaves persistent, simple, entire, resinous-dotted . . . . . *Myrica*

A. Leaves deciduous in autumn; with a broad blade, not needle-like

a. alternate (one leaf at a node)

fruit a cone; buds solitary, stalked, with 3 scales which meet at the edges *Alnus*

fruit not a cone; buds not as above

b. leaves simple

leaves parallel-veined, appearing fan-like . . . . . *Ginkgo*

leaves with a midrib, net-veined

leaves clothed with silvery or brownish scales . . . *Elaeagnus*

leaves without scales

c. margin entire, neither toothed nor lobed

sap milky, twigs spiny . . . . . *Maclura*

sap not milky, twigs not spiny

leaf broad as long, heart-shaped . . . . . *Cercis*

leaf longer than broad

with a narrow scar completely encircling the twig at nodes . *Magnolia*

without such scar

leaf widest above middle and with veins anastomosing . . . . . *Asimina*

leaf widest at or below middle or occasionally above middle but with veins not anastomosing, scarcely visible; leaf leathery.

Underside finely hairy . . . . . *Quercus*

Not hairy below

twigs very slender . . . . . *Celtis*

twigs moderately stout

pith with diaphragms; leaf obovate, leathery, veins scarcely visible . . . . . *Nyssa*

pith without diaphragms; leaf oblong . . . . . *Diospyros*

cc. leaf margin toothed

d. with several strong veins from the base.

e. about as broad as long

lobed . . . . . *Kalopanax*

not lobed . . . . . *Tilia*

ee. longer than broad . . . . . *Celtis*

dd. with only one strong vein from the base

twigs rather spiny

leaves folded in the bud; fruit apple-like *Malus*

leaves rolled in bud; fruit pearlike; with many short spurlike branches *Pyrus*

armed with long, sharp thorns; buds stout, red, with fleshy scales . . . . . *Crataegus*

not spiny nor armed with thorns

e. margin singly toothed

f. teeth coarse, or if small then widely spaced.

leaf base oblique . . . . . *Ulmus*

leaf base not oblique

leaf about broad as long . *Populus*

longer than broad

teeth few or margin entire *Nyssa*

teeth many

buds long, cigar-shaped. *Fagus*

buds short

leaves obovate, veins curved, teeth longish *Quercus*

leaves widest at middle;  
 veins quite straight, side  
 veins parallel, teeth short,  
 one at end of each vein . . . *Castanea*

ff. teeth fine  
 petiole with small glands . . . . . *Prunus*  
 petiole without glands  
 leaves linear or lanceolate . . . *Salix*  
 leaves broader, ovate-lanceolate to ovate.  
 bark not scaly, looks muscular. *Carpinus*  
 bark scaly, leaf-base symmetrical

g. with stipules  
 stipules persisting, pet-  
 ioles short. . . . *Photinia*  
 stipules deciduous, peti-  
 oles longer, slender. *Amelanchier*

gg. without stipules, leaves thin,  
 bark shredding . . . *Halesia*

ee. margin doubly toothed  
 base oblique . . . . . *Ulmus*  
 base symmetrical  
 bark scaly, peeling in long strips . . . *Ostrya*  
 bark not scaly.  
 bark in layers, often papery . . . *Betula*  
 bark not in layers, muscular . . . *Carpinus*

ccc. leaf lobed  
 h. with several strong veins from the base  
 sap milky . . . . . *Morus*  
 sap not milky; leaves broad as long  
 leaves notched at tip . . . . . *Liriodendron*  
 leaves palmate, maple-like  
 with a narrow scar around each node; base  
 of petiole enlarged over the bud. *Platanus*  
 without such scar, buds unconcealed . . . *Liquidambar*

hh. with only one strong vein from the base; vari-  
 ously lobed  
 mucilaginous and aromatic; margin entire. . . *Sassafras*  
 not so; margin toothed  
 pith star-shaped in section; buds with thin  
 overlapping scales . . . . . *Quercus*  
 pith round; twigs with long, sharp spines; buds  
 very short, red, with hard, thick scales  
*Crataegus*

bb. leaves compound

i. singly odd-pinnate  
 j. with stipules  
 margin serrate  
 leaflets often lobed; hairy, velvety . . . . . *Koelreuteria*  
 not lobed, not hairy . . . . . *Sorbus*  
 margin entire  
 armed  
 with paired spines at base of leaves . . . . . *Robinia*  
 with large simple or branched spines on the stem. *Gleditsia*  
 unarmed  
 leaflets usually alternate, elliptic to ovate, short  
 acuminate; petiole swelled to cover the bud;  
 branchlets brown . . . . . *Cladrastis*  
 leaflets oblong-elliptic, smaller, opposite, acute;  
 branchlets green; buds not concealed . . . *Sophora*

jj. without stipules, unarmed  
 j'. margin serrate  
 with glands at base of leaflets; twigs yellowish,  
 velvety . . . . . *Ailanthus*  
 without glands, pith star-shaped in section  
 pith solid; leaves hard, lustrous, or nearly  
 tomentose, and glandular when young . *Hicoria*

pith chambered, i.e. with cavities; leaves  
 soft, dull . . . . . Juglans  
 jj' margin almost entire; without glands; bark  
 shredding; fruit a capsule . . . . . Cedrela  
 ii. leaves doubly pinnately compound  
 armed with large, simple or branched spines on the  
 stem; leaflets small, oval or elliptic . . . . . Gleditsia  
 unarmed  
 margin entire; leaflets larger, ovate . . . . . Gymnocladus  
 margin toothed or lobed; leaves hairy . . . . . Koelreuteria  
 iii. leaves palmately 3-parted . . . . . Laburnum  
  
 aa. leaves opposite  
 j. simple  
 lobed . . . . . Acer  
 not lobed  
 k. margin entire  
 leaves broad, net-veined; bark cherry-like . . . . . Syringa  
 (see shrubs)  
 longer, suborbicular or elliptic to oblong; veins  
 anastomosing; bark not cherry-like . . . . . Cornus  
 kk. margin crenate-serrate or serrate  
 twigs swollen at the nodes; leaves not lobed . Cercidiphyllum  
 twigs not swollen at nodes; leaves occasionally lobed  
 jj. compound Acer  
 leaflets pinnate  
 leaves punctate with pellucid dots; twigs glossy . . . Phellodendron  
 leaves not as above  
 leaflets lobed or at least the lower ones; twigs  
 bloomy . . . . . Acer  
 leaflets not lobed; twigs not bloomy . . . . . Fraxinus  
 leaves palmate  
 twigs stout, buds large . . . . . Aesculus  
 twigs slender, buds small . . . . . Acer  
 aaa. leaves whorled, i.e. more than two at a node.  
 leaves 3-5 veined at the base; petioles and twigs glabrous. . Catalpa  
 with one main vein; petioles and twigs rusty pubescent or  
 tomentose . . . . . Paulownia

#### KEY TO THE TREES IN WINTER

a. leaf scars whorled or opposite  
 scars notched at the top; buds superposed; fruit an ovoid capsule . . . . .  
 Paulownia  
 scars not notched; buds not superposed; fruit a very long, terete pod  
 Catalpa  
 aa. leaf scars opposite  
 b. twigs swollen at nodes; buds often developing short spurs. Cercidiphyllum  
 bb. twigs not swollen at nodes  
 twigs covered with silvery or brown scales (appearing in very young  
 growth like the fuzz of a peach); bark fibrous,  
 interwoven . . . . . Elaeagnus  
 twigs not covered with scales  
 end-bud lacking, twigs forking, bark cherry-like . . . . . Syringa  
 (see shrubs)  
 end-bud or its scar present  
 end-bud very large ( $\frac{1}{2}$ " or more); twigs thick. . . Aesculus  
 end-bud moderate or small ( $\frac{1}{4}$ " or less)  
 c. leaf-scars meeting around the twig  
 scars small, often on raised bases, crescent-shaped;  
 joined by a concave line; bud-scales  
 nearly or quite valvate . . . . . Cornus

scars V-shaped, meeting in a convex line, an inverted V or ragged line; bud scales imbricate . . . . . *Acer*

cc. leaf scars not meeting around the twigs; buds sessile leaf scars shield-shaped; buds with 2-4 scales; bundle traces numerous in an ellipse. *Fraxinus*

leaf scars horseshoe shaped, almost meeting around the bud; buds compressed from the sides and silky-brown hairy . . . . . *Phellodendron*

aaa. leaf scars alternate (only one at a node)

  d. fruit a cone; ordinary leaf scars present; buds moderately large, solitary, stalked, with 3 scales which meet at the edges . . . *Ainus*

  dd. fruit not a cone; buds not as above

    e. buds hemispherical, with many scars clustered about them, developing into short spurs . . . . . *Ginkgo*

  ee. not thus

    f. leaf scars very large

      g. twigs thick, end-bud lacking

        twigs yellowish, velvety; buds solitary, smallish, hairy, located close to scar . . . . . *Ailanthus*

        twigs glabrous, glossy, whitened as though with paint; buds minute, superposed, in tiny silky craters removed from the scar . . . . . *Gymnocladus*

  gg. twigs moderately thick, end-bud present

    buds superposed, hairy, fairly large; pith with cavities; fruit a nut; twigs more or less fluted; bundle traces in 3 groups . . . . . *Juglans*

    buds solitary; twigs terete; bundle-traces 5; fruit a capsule . . . . . *Cedrela*

  ff. leaf scars moderate or small

  h. twigs green

    mucilaginous and aromatic; buds small, glabrescent, subglobose with fleshy scales . . . . . *Sassafras*

    not mucilaginous nor aromatic nor with fleshy scales.

    i. buds silvery, silky-hairy

      stipules persistent; twigs slender . . . *Laburnum*

      stipules not persistent, their scars left; twigs moderate, encircled by a line at the nodes . . . . . *Magnolia*

    ii. buds not silvery, silky-hairy, but woolly, superposed, at first covered by the leaf scar; sometimes thorny . . . . . *Sophora*

  hh. twigs not green

    j. with a narrow scar encircling the twig at the nodes

      buds long, slender, pointed (cigar-shaped) . . . *Fagus*

      buds not long and pointed

      terminal buds flattened like a thumbless mitten over the twig-tip, with two valvate scales . . . . . *Liriodendron*

      terminal buds not flattened, with 1 scale only

      buds hairy; leaf scar U-shaped . . . *Magnolia*

      buds not hairy, leaf scar scalloped, encircling the bud . . . . . *Platanus*

    jj. scars not or rarely meeting around the twig.

    k. with spines or thorns

      twigs with silvery or brown scales . . *Elaeagnus*

      twigs not scaly

    l. with thorns or prickles between the nodes

      prickles short, numerous . . . . . *Kalopanax*

      thorns long, large, often branched; nodes swollen, reddish, looking like an angry sore . . . . . *Gleditsia*

    ll. thorns or prickles at the nodes only

      thorns stipular, paired . . . . . *Robinia*

      thorns not stipular

      thorns small, slender, beside the

bud (lateral); buds with thin scales; sap milky . . . *Maclura*  
 spines long, stiff, sharp, axillary, becoming twigs; buds with firm, hard, fleshy scales, usually red; sap not milky . . . . . *Crataegus*  
 kk. without spines or thorns  
 twigs resinous-dotted . . . . . *Myrica*  
 twigs not resinous-dotted  
 end-bud naked; buds silky-brown  
 hairy . . . . . *Asimina*  
 end-bud with scales, or lacking  
 m. lowest bud scale centered over the leaf scar  
 bud with only 1 scale . . . *Salix*  
 bud with several scales . . *Populus*  
 mm. lowest scales at side of bud  
 bark silvery; twigs with corky ridges; pith star-shaped . . . *Liquidambar*  
 not thus  
 n. buds superposed  
 pith solid, crossed by diaphragms . . . *Nyssa*  
 pith not solid or not crossed by diaphragms  
 leaf scar C-shaped, almost encircling the buds; buds brown-silky in aggregates resembling single buds . . . *Cladrastis*  
 leaf scar more narrow; bark of twigs scurfy, rubbing off in fine, hairlike threads; buds with 4 fleshy red scales . . . *Halesia*  
 bark not scurfy  
 buds rather large; scars with numerous bundle traces in 3-4 groups; pith solid . . . *Hicoria*  
 buds smaller; bundle traces 3  
 twigs almost black or with a reddish cast; scars fringed at the top; flower buds between the nodes . . . *Cercis*  
 twigs lighter; pith solid and crossed by diaphragms . *Nyssa*  
 nn. buds solitary  
 buds  $\frac{1}{2}$ -ellipsoid, directed almost at right angles to the twig and with 2 exposed scales . . *Koelreuteria*  
 buds not as above, spreading  
 o. buds red, or green tinged red.  
 buds long, slender, with twisted scales . . . *Amelanchier*  
 buds short, stout, with

fleshy scales . . . . . *Tilia*  
oo. buds not or very slightly red  
p. bud scales keeled  
    scales mucronate; twigs slender,  
    not spinescent . . . *Photinia*  
    scales not mucronate; twigs mod-  
    erate, spinescent . . .  
    scales pubescent and margined . *Malus*  
    scales glabrous, not margined . *Pyrus*  
pp. bud scales not keeled nor mucronate  
    q. buds in two rows (2-ranked)  
        without stipule scars; buds a  
        little flattened . . . *Diospyros*  
        with stipule scars  
            with 2 or 3 scales; bud not  
            flattened; pith 3-sided,  
            continuous, green . . . *Betula*  
with more than 3 scales  
    r. bud scales in 2 rows,  
        bark scaly  
            scales not striate . . . *Ulmus*  
            scales striate . . . *Ostrya*  
    rr. bud scales in 4 rows; bark  
        muscular . . . . . *Carpinus*  
    qq. buds not in 2 rows  
        s. twigs more or less fluted,  
            moderate  
                end-bud solitary or lacking;  
                bundle traces 3 . *Castanea*  
                end-bud multiple; bundle  
                traces numerous, more  
                than 3 . . . . . *Quercus*  
    ss. twigs rounded  
        buds elongated, end-bud  
            rather large and covered  
            with long, white hairs  
            emerging from inner  
            scales . . . . . *Sorbus*  
        buds all smaller; often  
            collaterally multiple  
        buds fat, sap milky . *Morus*  
        buds slender, sap not milky  
            twigs with a bitter  
            almond flavor . . *Prunus*  
        twigs not flavored  
            buds very small, closely  
            appressed; bark  
            with corky warts  
            or ridges . . . . . *Celtis*

The Genus ACER is distinguished in  
 SUMMER : by the opposite arrangement with the leaf scars meeting in a point; the leaves thin, generally lobed, palmately veined; the fruit a paired samara.  
 WINTER : by the opposite arrangement, with the leaf scars meeting in a point and ciliate at the top; twigs rather slender; buds sessile, of moderate size, with imbricate scales.

Species	leaves	leaf form	lobe tips	leaf edge	under side of leaves	flowers	veination	sap	sinus	leaf shape
negundo	compound	lobed		doubly serrate						
tataricum	simple	not lobed		sinuate	pubescent	light green	corymbs			
campestre	"	3-lobed	obtuse	entire	white	erect				milky
spicatum	"	"	taper-pointed	doubly serrate	downy	panicles				
ginnala	"	"	" central lobe long,	"	glabrous	pendulous				
pennsylvanicum	"	"	pointed	serulate	brownish	racemes				
pseudoplatanus	"	5-lobed	acute	fully serrate	green	pendulous	impressed	not milky		
saccharinum*	"	"	acute or acuminate	deeply serrate	"	lateral	not impressed	not milky	deep oval	
rubrum	"	"	acute or acuminate	crenate-serrate	glauconous	corymbs	"	milky	round	angle
palmatum	"	deeply 5-7 lobed	acute	fully serrate	double	glabrous	few-fld			
platanoïdes	"	"	finely pointed	coarsely serrate	bright	gr. corymbs	bearded	milky		broader
saccharum	"	"	3-pointed	dentate	glabrous	lustrous leafy	" in axils	not milky		than long
nigrum	"	"	central point	few coarse teeth	glabrous	pendulous	corymbs	"		longer than broad
circinatum	"	7 or more acute lobes	with blunted shoulders	few coarse teeth	pale	"	soft-pubescent			
palmatum	"	"	acute	irregularly doubly serrate	pubescent				shallow	
japonicum	"	"	"	"	glabrous	purple corymbs	pubescent	"	deep-cut	
					glabrous	purple corymbs	except on veins	"	"	

The Genus *ACER* is distinguished in WINTER: by the opposite arrangement with the leaf scars meeting in a point and ciliate at the top; twigs rather slender; buds sessile, of moderate size, with imbricate scales.

species	bud scales	no. scales exposed	buds	twig color	texture	leaf scars	twigs	bark
<i>spicatum</i>	valvate	one pair	slender, short	gray	puberulent			
<i>pennsylvanicum</i>	"	"	large, stout	green	glabrous			never bloomy green striped white
<i>palmatum</i>	"	two	short, no end-bud	brown	glabrous	low and narrow	slender	
<i>japonicum</i>	valvate	more than two	"	green	"	broad, top winged	slender,	
<i>circinatum</i>	valvate	one pair	"	purple	"	broad, not winged	slabrous	
<i>negundo</i>	"	two	end-bud; short, fat, multiple, fascicled	glauous, green or red, scarlet to crimson	hairy	minute red glands above point	slender, crimson slender	"
<i>rubrum</i>	imbricate	four	"	red-brown	glabrous	glands above point in a point	slender, crimson slender	glabrous, bloomy, firm
<i>saccharinum*</i>	"	4-6	"	"	"	"	"	flaking
<i>platanoides</i>	"	"	large, flushed red	straw-color	pubescent	"	slender, dull	lenticellate, gray-brown
<i>nigrum</i>	"	more than six	moderate, acute	dark buff	glabrous	"	slender, dull	dark gray
<i>saccharum</i>	"	"	"	"	"	"	slender, dull	medium
<i>pseudoplatanus</i>	"	six	large acute, brown	"	"	"	slender, polished	gray
<i>campestre</i>	"	6-8	bright green, short, blunt, gray	"	"	"	moderate, glabrous	moderate,
<i>ginnala</i>	"	"	ovoid	woolly	"	"	moderate, pubescent	slightly corky
<i>tataricum</i>	"	"	very small, red-brown	glabrous	"	"	slender, glabrous	
			blunt, ovoid	"	"	"	slender, glabrous	
			small, blunt, blackish	"	"	"	glabrous, dark	
			ovoid	"	"	"		

The genus **AESCULUS** is distinguished in  
 SUMMER : by the opposite arrangement; large, palmately compound leaves without stipules; flowers  
 long-clawed.  
 WINTER : by the stout twigs; opposite arrangement; very large buds; and large, low, triangular leaf-scars.

Summer Key

Species	fruit	bud	leaflets	leaf edge	flowers	habit	petals
glabra	prickly	dry	5, obovate	serrate	yellowish with long stamens		eglandular, margin villous; nearly equal; claws longer than calyx
carnea	"	sticky	5-7, oblong, sub sessile	doubly serrate obtusely	salmon pink to scarlet		glandular, villous on margin
hippocastanum	subgloboso	at first sticky	7, obovate, sessile	serrate	white spotted red, stamens exserted	tree	5, claws not longer than calyx
prickly		sticky					
subgloboso							
octandra	smooth	dry	petiolated	finely serrate	yellow, calyx glandular-villous	large tree	petals unequal, calyx glandular-villous
pavia	"	"	petiolate, glabrous beneath	serrate	reddish, calyx tubular	small tree	glandular margined
parviflora	"	"	5-7, elliptic gray-pubescent beneath	crenate-serrulate	white, small, stamens long	shrub	4-5, $\frac{1}{2}$ length of the stamens or less

Winter Key

species	buds	habit	bark	bud scales
hippocastanum	sticky	tree		
carnea	sticky, becoming dry	"		
glabra	dry	"	rough, soft, corky	
octandra	dry	"	smooth, firm	
pavia	dry	tree or shrub		lowest less than $\frac{1}{2}$ the length of the bud
parviflora	dry	shrub		lowest $\frac{1}{2}$ as long as the bud

**ATLANTHUS ALTISSIMA\*** is distinguished in

**SUMMER** : leaves alternate, pinnately compound, estipular, margin toothed and with glands at the base of the leaflets; branchlets and petioles glabrous or slightly puberulous; leaflets glabrous on the under side; odor unpleasant when bruised; fruit winged, in paniculate clusters.

**WINTER** : leaf scars alternate, large; end-bud lacking; twigs yellowish, velvety; lateral buds solitary, smallish, hairy, with 2-4 scales, located close to the leaf scar; odor rank when cut or bruised.

The Genus **ALNUS** is recognized in

**SUMMER** : by the thick leaves with impressed, reticulate veination; stalked, axillary buds; cone-like fruits; and triangular twigs with a three-sided or triangular pith.

**WINTER** : by the stalked brown-violet buds with three valvate scales, almost triangular in cross section; twigs and pith triangular; woody cones persistent. Later - in early spring, the flowers with four stamens.

species	pistillate catkins	winter buds	flowers	twigs	cones	young growth	cone position	leaves
viridis	terminal, protected within buds	sessile, with 2 or more unequal scales	with the leaves	more or less pubescent	having seeds with a broad wing	glutinous	ovate, finely serrulate, broad cuneate, 5-10 pairs veins	
glutinosa	axillary, exposed	stalked, with 2-3 equal scales; leaves plicate	before the leaves	glabrous, young growth peduncled very glutinous puberulent, rarely densely villous pubescent	all distinctly very glutinous	glutinous	green beneath, obtuse, dentate, bearded	
rugosa	"	"	"	partly sessile	glutinous	upright	green beneath, serrulate, bearded	
incana	"	"	"	sessile or stalked	tomentose or nearly glabrous	nodding	glaucous beneath or tomentose,	
japonica	stalked, with 2-3 equal scales; leaves not plicate		glabrous or slightly pubescent	peduncled	glabrous		not bearded - - - - -	

Winter and Summer Keys combined -- **ALNUS**

**ATLANTHUS**

**ALNUS**

The Genus AMELANCHIER is recognized in  
 SUMMER : by the alternate leaves which are thin, light in color tone, simple, oval or oblong, with a finely serrate edge; flowers white, in loose racemes, with 5 slender petals; fruits small berrylike pomes, red or purple, sweet and edible.  
 WINTER : twigs slender, zigzag, red-gray; buds red, long, slender, sessile, with about 6 twisted scales; leaf-scars two-ranked, slightly elevated, crescent-shaped, with three bundle traces and no stipule scars.

species	styles	summit of ovary	sepals	habit	buds	leaves	bark	leaf form
ovalis	very short distinct	woolly	short, recurved	shrubby, branches upright	blackish, stout	oval, glabrous, coarsely serrete above the middle		
floridana	prominent, joined at base, 5	Glabrous	erect	tree to 50-70!	more red than A. canadensis	coarsely callus- serrate, glabrous from the first, often	red-brown with dark lenticels; abrupt twigs pointed,	elliptical, acute or short oblong,
laevis	"	"	erect			bronze-purple	glabrous	rounded or acute
oblongifolia	"	"	erect, lance- deltoid	shrubby in dense clumps		densely white-woolly when young	red-gray	obovate, or oblong,
canadensis	"	"	ovate, reflexed almost erect	small tree 30-40!	slender, green or tinged brown	densely white-woolly when young; finely serrete	ash-gray with pale lenticels; acuminate young twigs hairy	acute

Summer and Winter Keys combined -- AMELANCHIER

The Genus ASIMINA is distinguished in  
 SUMMER : by the large, alternate leaves, obovate-oblong, simple, entire, pinnately veined, anastomosing, estipular, short acuminate, cuneate; petiole short; flowers appearing with the leaves, axillary, solitary, deep red-violet, with 3 sepals and 6 petals; fruit a rather large, edible, oval to oblong berry with flattened seeds in 1-2 ranks, greenish-yellow turning brown.  
 WINTER : shrub or small tree with an unpleasant odor when bruised; twigs moderate, red-pubescent when young, becoming glabrous and brownish; pith terete, white, continuous, with greenish dia-phragms, becoming brownish and chambered; terminal bud naked, elongated, red-tomentose, lateral buds oblong or globose, sub sessile, oblique; leaf scars alternate, 2-ranked,  $\frac{1}{2}$ -round becoming crescent shaped by rupture of membrane over buds, with 5-7 or more bundle traces and no stipule scars

Asimina triloba

The Genus **BETULA** is recognized in

**SUMMER** : leaves alternate, petioled, ovate, usually serrate; flowers monoecious, in catkins; fruit a minute nut with membranous wings, formed in conelike clusters with deciduous, leafy bracts which shed from the tip of the cluster.

**WINTER** : Twigs slender, zigzag, terete, frequently with dwarf shoots which make the lateral buds appear stalked; pith minute, triangular, greenish; buds moderate, solitary, tapering at both ends, with 2-3 exposed scales, imbricate; leaf scars alternate, half-elliptical, small, with two bundle traces and narrow stipule scars.

species	habit	bark	bark structure	branchlets	leaf tip	leaves	leaf edge	pubescence
<i>Dumile</i>	shrubby	dark			acute	obovate, 4-6 pairs veins,		pubescent when young
<i>nana</i>	shrubby, low, spreading	"	densely tomentose, with long hairs	rounded		suborbicular, gland-dotted beneath, 4-6 pairs veins		glaious
<i>nigra</i>	tree	orange-brown	glabrous, glandless			rhombic-ovate		
<i>lutea</i>	"	yellowish	loose and shaggy	no odor or flavor, pubescent		7-9 pairs impressed veins, often white		
<i>lenta</i>	"	red-brown	splitting in filamentous layers	oblong-ovate, lighter beneath, 7-9 pairs veins	oblong-ovate, lighter beneath	7-9 pairs imp. pressed veins, often white	finely serrate	pale hairs on veins above and below
<i>populifolia</i>	"	chalky-white	slightly flavored, bitterish resinous	slightly flavored, bitterish resinous	acute	oblong-ovate, thinnest beneath	under	
<i>papyrifera</i>	"	rub off slightly	in layers	glandular, resinous	acute	oblong-ovate, acuminate	sharply doubly serrate	
<i>pendula</i>	eventually pendulous	white, rubs off freely, exfoliating	splits in thin layers; under ones cream to cinnamon color	glandular	acute	ovate, base subcordate, veins, glabrous	coarsely serrate, not deep-where cut	hairy only
		creamy-white	fewer layers	resinous-glandular	"	rhombic-ovate acuminate	serrate	sheltered persistent leaves
		scarcely rubs off; exfoliating		resinous-glandular, glabrous		cuneate	deeply cut	glutinous when young

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Summer and Winter Keys combined --- **BETULA**

The Genus *GARYA* \* is distinguished in

**SUMMER** : trees with a hard, tough wood and scaly buds; leaves alternate, pinnately compound, the tip three leaflets larger than the lower ones, estipulate; flowers with the leaves, of two kinds on the same tree, in catkins, the staminate flowers in axillary, pendulous aments, the pistillate flowers sessile, in terminal spikes; fruit a nut in a 4-valved husk.

**WINTER** : twigs terete, stiffly held; buds rather large, sometimes stalked or superposed, the terminal bud much larger than the laterals, ovoid or oblong, with one to several exposed scales; leaf scars alternate, shield shaped or 3-lobed, large, low, with numerous bundle traces in about three more or less definite groups, and without stipule scars.

Species	bud scales	fruit with winged sutures	nut shell	leaflet	nut	winter buds	nut husk	leaves	bark	leaves & petioles	twig color
pecan	4-6 valvate	thin	7-17 falcate	nearly terete, shell thin, sweet	elongated	slender, elongated to base, thin	splitting			tomentose, glandular when young	
cordiformis	4-6 valvate	thin	5-9 falcate	compressed stout, broad as glandular, bright yellow	—	—	splitting				
laciniosa	imbricate, more than 6	thick sutures not winged	not falcate leaflets 7-9		outer scales persistent	to below middle	—				
ovata	"	"	not falcate leaflets 5		"	splitting to base	with 7-9 leaflets	shaggy	glabrous or pubescent	gray to light red-brown	
tomentosa*	"	"	not falcate	angled, kernel sweet	outer scales deciduous; bud large $\frac{1}{2}$ -1"	not splitting to base	5-7 leaflets	shaggy	"	gray to tomentose	
glabra	"	"	"	"	slightly angled, kernel bitter	small $\frac{1}{4}$ - $\frac{1}{2}$ "	thin, splitting only to middle	5, rarely 7 leaflets. glabrous	firm, not shaggy	glabrous	

The Genus **CASTANEA** is recognized in

**SUMMER** : leaves alternate, simple, straight-veined, oblong, rather acuminate to acute, coarsely serrate with bristle-like teeth; nuts enclosed in a prickly bur formed by the involucre;  
 nuts terete; staminate flowers in slender aments.

**WINTER** : gray, fissured, with smoothish ridges; buds ovoid, sessile, oblique, with 2-3 exposed scales; leaf scars alternate, scarcely raised, moderate to small in size,  $\frac{1}{2}$ -round, with 3 bundle traces and with elongated, unequal stipule scars; twigs olive brown, polished or hairy.

species	nuts	habit	branchlets	leaves	twigs
pumila	higher than broad, solitary in a spiny involucre	shrubby		elliptic-oblong, tomentose beneath	tomentose
dentata	broader than high, 2 or more in one involucre	tree	glabrous	oblong-lanceolate, glabrous, base cuneate	olive-brown, polished
mollissima	"	"	short pubescent	elliptic-oblong, soft pubescent beneath, base rounded	dull, hairy

Summer and Winter Keys combined

— CASTANEA

The Genus **CARPINUS** is recognized in

**SUMMER** : leaves deciduous, alternate, simple, pinnately veined with 7-24 pairs straight veins, with the base symmetrical and the margin doubly toothed, more or less 2-ranked; fruit a small, ribbed nutlet enclosed in a 3-pronged involucre; fruits in a spike-like, muscular appearing cluster, acute, with many imbricate scales in 4 rows.

**WINTER** : bark smooth and firm, muscular appearing; twigs slender, zigzag; buds solitary, 2-ranked,

GENUS	bark	bud scales	leaves	stamine catkins	involucre
Carpinus	smooth and firm	in 4 rows, not striate	ovate-oblong, glabrous except veins pilose beneath and with axillary tufts of hair	appearing in spring	3-cleft, leafy
Ostrya	rough and shredding in long strips	in 2 rows, striate	ovate to ovate-oblong, larger, sparingly hairy above and below	formed in autumn	a bladderlike closed bag

Summer and Winter Keys combined

— CASTANEA

— CARPINUS

The Genus CATALPA is recognized in

**SUMMER** : leaves very large, simple, ovate, long-petioled, with an acute to acuminate tip and entire margin, 3-5 veined at the base, usually with a purplish glandular spot in the vein-axils beneath; flowers white or yellowish in large, showy panicles; fruit a long, terete, 2-valved pod with thin, ciliate seeds wrapped around a central partition.

**WINTER** : twigs coarse, yellow to yellow-gray; leaf scars whorled, elliptical, raised, with many bundle traces arranged in an ellipse; buds comparatively small, solitary and sessile, with 6 or more loose, pointed scales; terminal bud lacking; fruits persistent.

species	habit	flowers	leaf form	leaf tip	seed wings	fruits	branches
bungei (or big-nonioides nana)	low, mound-top grafted	white in corymbose racemes	triangular-ovate, glabrous beneath	long-acuminate, base truncate			
ovata*	tall, loose spreading tree	yellowish	broad-ovate, 3-5 lobed, nearly			long, very slender, $1/8$ " diameter	glabrous
bignonioides	"	white, glabrous	glabrous not or seldom lobed, ovate, pubescent on veins below	abruptly acuminate on	pointed ends	long, slender $1/4$ " diameter	light brown, crooked and straggling
speciosa	"	"	not or seldom lobed, ovate, densely pubescent below	long acuminate	rounded ends	coarser, $1/2$ " diameter	red-brown, not crooked and straggling

Summer and Winter Keys combined --- CATALPA

GEDRELA SINENSIS : is distinguished in

**SUMMER** : leaves alternate, pinnately compound, glandular, estipular, long petioled; leaflets 10-20, short-stalked, oblong to lance-oblong, acuminate, remotely serrate or entire, pubescent on the veins at first, becoming glabrous; flowers small, whitish, in large pendulous panicles; fruit an obovoid capsule with winged seeds.

**WINTER** : tree with smoothish or shredding bark; twigs coarse, terete, puberulous when young, with a large, rounded pith which is white at first becoming brownish; leaf scars large, alternate, heart-shaped, slightly raised, with 5 bundle traces and no stipule scars; buds solitary, sessile, subglobose, with 4 or more short pointed scales; end-bud much larger. This tree is very similar to Ailanthus but easily distinguished therefrom by the large end-bud and by the absence of glands at the base of the leaflets.

The Genus **CELTIS** is recognized in

**SUMMER** : tree with a rough, corky, light gray bark; leaves simple, alternate, thin and rough to touch, ovate to ovate-lanceolate with an acuminate tip and oblique base, margin coarsely singly serrate, with 3 main veins at the base; fruit a small, globular drupe, with a date-like flavor; pith somewhat angular, occasionally chambered.

**WINTER** : unarmed; bark light gray, corky; twigs slender, zigzag, brownish, lacking; leaf scars alternate, small, with one bundle trace (or appearing as one); pith rather angular, chambered in places; buds small, appressed, somewhat triangular.

species	bark	buds	leaves	
<i>occidentalis</i>	with thick, corky, curly ridges	long	ovate to ovate-oblong, subcordate, sharply singly serrate, acuminate	fruit pedicel
<i>laevigata</i> *	with corky warts	short	ovate to oblong-lanceolate, almost entire, long acuminate, base broad cuneate	longer than the petiole shorter than the petiole

Summer and Winter Keys combined -- **CELTIS**

**SUMMER** : leaves opposite, simple, petiolate, suborbicular, obtusish, cordate, palmately veined, dark bluish-green above, glaucous beneath, margin crenate-serrate; twigs swollen at the nodes by the much raised leaf cushions.

**WINTER** : a small tree; twigs glabrous, much enlarged at the nodes; leaf scars opposite or 4-ranked, short spurs, moderate, solitary, oblong, pointed, appressed, with one exposed scale.

**CERCIDIPHYLLUM JAPONICUM** is distinguished in

**SUMMER** : leaves alternate, simple, suborbicular, cordate, petiolate, entire, palmately veined, with small caducous stipules; flowers fascicled, before the leaves, rosy-pink, pealike, adventitious; fruit a flat legume, narrowly winged on the ventral suture. **WINTER** : shrub or small tree; bark very dark with reddish fissures; twigs blackish, zigzag, pith rounded, continuous; leaf scars alternate, 2-ranked, somewhat raised, obtusely triangular, fringed at the top, with decurrent ridges, having 3 bundle traces and no stipule scars; buds glabrous, superposed, the upper stalked, the lower sessile, ovoid or obovoid, with 2 to several often keeled scales; end-bud lacking, flower buds adventitious.

**CLADRASTIS LUTEA** is distinguished in

**SUMMER** : leaves alternate, pinnately compound, estipular; leaflets alternate, short-stalked, rather large, elliptic to ovate, entire, short acuminate; petiole swelled to cover the bud; branchlets red-brown. **WINTER** : tree with smooth bark and yellow wood; twigs red-brown; leaf scars alternate, almost encircling the bud, 2-ranked, C-shape, with 3-5 bundle traces and no stipule scars; buds naked, silky brown hairy, in aggregates resembling single buds, sessile.

**CELTIS** -- **CERCIDIPHYLLUM** -- **CERCIS** -- **CLADRASTIS**

The Genus CORNUS (tree forms) is recognized in

SUMMER : leaves opposite, simple, entire, with the veins parallel, curving, and anastomosing, petiolate. (N.B. one species shows alternate arrangement); floral parts in fours; fruit a small drupe in G. alternifolia, connected around the twig, terete, with a white, continuous pith; leaf scars opposite except 3 bundle traces and no stipule scars; buds solitary, stalked, oblong, with two scales valvate or nearly so; flower buds conspicuous for size and shape.

Summer Key

species	arrangement	fruit	flower-heads	leaves
alternifolia	alternate	blue-black, bloomy on red pedicels	terminal, loose, flat cymes, without an involucre	with 5-6 pairs veins veins, base cuneate, margin entire
mas	opposite	red	opposite, terminal or axillary dense umbels, with involucre flowers yellow dense terminal cymes with showy white involucre	green beneath, glabrous whitened beneath
florida	opposite	red	notched at tip	—
kousa	opposite	red, connate in globose head	dense terminal cymes with showy white involucre pointed at tips	glaucous beneath with large axillary tufts of hairs

Winter Key

species	leaf scars	leaf buds	flower buds	leaf axils	branchlets
alternifolia	alternate				
kousa	opposite	concealed in leaf scars	enlarged	brown hairy	glabrous, greenish
florida	opposite raised	concealed in leaf scars	enlarged flattened lengthwise	not brown-hairy	reddish on upper side
mas	opposite	not concealed, very divergent	—	enlarged, ovate to obovate	—

The Genus *CRATAEGUS* is distinguished in

SUMMER : thorns long, stiff, sharp-pointed; leaves simple, alternate, stipulate, toothed or lobed; flowers in corymbs; fruit a pome-like drupe, with 1-5 bony nutlets.

WINTER : thorns long, stiff, sharp-pointed; buds short, stout, hard, with fleshy red scales.

species	leaves	fruit	veination	leaf edge	lobes	petioles	anthers	thorns
<i>phaenopyrum</i>	deltoid, subcordate, subcoriaceous, with 5-7-5 lobes, glabrous	scarlet, with nutlets, small corymbose	5 to points of lobes & sinuses	sharply serrate	3-5			long, slender
<i>oxyacantha</i>	lobed, broad ovate	red, subglobose, with 1-2 nutlets	lower or secondary veins curved in	broadly serrulate	3-5 deep-cut			short or lacking
<i>monogyna</i>	to obovate, cuneate glabrous, yellow-green beneath	ellipsoid, with 1 nutlet	secondary veins curved out	entire or few-toothed	3-7 or more deep-cut			"
<i>crusgalli</i>	lobed, broad ovate to obovate, blue-green beneath	dull red, subglobose, with 1 nutlet	points sharply not lobed	not lobed	short			moderate, numerous, curved
<i>punctata</i>	oval to obovate, not lobed, thick & leathery, very glossy, cuneate	dull red, subglobose, glabrous without cavities and teeth on the 2 nutlets	points of lobes serrate except near the base	not lobed				stout & short or wanting
<i>succulenta</i>	obovate or oval, cuneate, dotted, dull surfaced	dotted red, ellipsoid, with 3-5 nutlets	impressed, irregularly not or serrate	short, very lit-margined	long & slender	long & rose-color	long, stout	stout, short or wanting
<i>coccinea</i>	broad-elliptic, not lobed, cuneate	subglobose, bright red with 3 nutlets, pulpy	coarsely serrate	slender				stout, curved

Summer and Winter Keys combined -- *CRATAEGUS*

*DIOSPYROS VIRGINIANA* is recognized in

SUMMER : leaves alternate, long, elliptic, drooping, entire, estipulate; flowers dioecious, regular, axillary, inconspicuous; fruit a several seeded berry with the calyx persistent, seeds flattened.

WINTER : bark checkered; young branchlets pubescent or glabrous; twigs moderate, terete, yellow-gray to red-brown, lenticular; pith moderate, greenish-white; buds covoïd, flattened, with 2-3 overlapping scales, solitary, sessile; terminal bud lacking.

*CRATAEGUS*

-- *DIOSPYROS*

The Genus FAGUS is distinguished in  
 SUMMER : bark smooth, gray; leaves alternate, simple, green beneath, 2-ranked, plicate in the bud, with strong, straight veins parallel and ending each in a tiny tooth; flowers of two kinds, the staminate in heads, the pistillate paired in a 4-parted involucre; fruit a triangular nut, in pairs in a prickly 4-parted involucre.  
 WINTER : bark silver-gray, smooth; buds slender, golden-brown, cigar-shaped.

Summer Key

species	veination	leaf edge	fall color	bark	color of veins and petioles	leaves
grandifolia*	9-14 pairs veins coarsely serrate		yellow-bronze	very light gray	green	ovate-oblong, acuminate
sylvatica	5-9 pairs veins remotely denticulate		red-bronze	medium gray	green	ovate or elliptic, acute
sylvatica purpurea	5-9 pairs veins denticulate	red-bronze	deeper, purplish gray	red	red	"

Winter Key

species	twigs	buds	bud color	bark
grandifolia*	glabrous, lustrous, elongated, with about 8 pairs of scales	yellow-brown, lustrous	light gray	
sylvatica	villous	slightly puberulent	red-brown, silky dull	deeper, medium gray
sylvatica purpurea	villous	puberulent, moderate	deeper, red-brown	deep gray

**The Genus FRAXINUS** is distinguished in

**SUMMER** : trees with opposite, pinnately compound leaves, the margin toothed but not lobed; flowers small, in crowded panicles from the axils of last year's leaves; fruit a small nutlet with an elongated wing at the top.

**WINTER** : twigs stout, stiff, widely divergent; leaf scars rather large, opposite,  $\frac{1}{2}$ -round to almost elliptical, with numerous bundle traces in an elliptical or C-shaped group and with no stipule scars; buds sessile, sometimes superposed, with 1-2 pairs of opposite scales.

**Summer Key**

species	twigs	lateral leaflets	rachis	parts	leaves beneath	leaf edge
<b>quadrangulata</b>	4-angled	7-11				
<b>nigra</b>	not 4-angled	7-11, oblong, sessile	with thick rufus tomentum		rusty-tomentose along the midrib	
<b>excelsior</b>	not 4-angled	7-11, sessile	without rufus tomentum	glabrous or pubescent on midrib only	pubescent with small incurved teeth	
<b>pennsylvanica</b>	not 4-angled	ovate to oblong-lanceolate, 5-9, petiolate	not winged	glabrous	pubescent beneath	
<b>lanceolata</b>	not 4-angled	elliptic-oblong, to lanceolate 5-9, petiolate	not winged	glabrous	glabrous, as green as the upper side	
<b>americana</b>	not 4-angled	ovate, slender-petiolated, 5-9	not winged	pale, glaucous	obscurely serrate or entire	
<b>twigs, petioles, veins, and buds</b>						

**Winter Key**

species	twigs	buds	twigs near tip	bud scales	bark	leaf scars	inner bark
<b>quadrangulata</b>	4-angled						
<b>excelsior</b>	not 4-angled	black or nearly so					turns water blue
<b>pennsylvanica</b>	not 4-angled	rusty tomentose, densely pointed at tip	pubescent			concave on top edge	inner surface reddish
<b>nigra</b>	not 4-angled	dark brown	not downy	3 pairs with apex apiculate	ridged	straight on top edge	yellowish
<b>lanceolata*</b>	not 4-angled	brown	not downy	4 pairs with rounded apex	not flaky	upper edge	
<b>americana</b>	not 4-angled	very brown, blunt at tip	not downy	4 pairs with lustrous apex rounded	ridged	deeply concave	

*GINKGO BILoba* is recognized in

SUMMER : leaves alternate, clustered on short spurs, fan-shaped, slender petioled, more or less incised at the tip, striated by the parallel veins.  
WINTER : branches irregularly placed and without lateral twigs near the tips; twigs yellow-gray, moderate, rounded; leaf scars alternate, crowded on short spurs, crescent-shaped, low, with 2 bundle traces and no stipule scars; buds brown, solitary, sessile, hemispherical with three or more scales.

*GLEDITSIA TRIACANTHOS* is recognized in

SUMMER : a large tree armed with stout, much branched spines which persist on the trunk; leaves alternate, often fascicled, pinnate or bi-pinnate on the same tree; leaflets small, obtusish, elliptic to oblong-lanceolate, entire; flowers in small, greenish racemes, inconspicuous; fruit a long, twisted, red-brown legume, indehiscent, many-seeded.  
WINTER : spines numerous and much-branched, very large; twigs zigzag, moderate, with swollen nodes; leaf scars comparatively large, irregularly shield-shaped, rimmed red and appearing sore and inflamed; buds glabrous, sessile, superposed, often more or less covered by the torn margin of the leaf scar, with few scales; end-bud lacking.

*GYMNOCLADUS DIOICUS* is recognized in

SUMMER : leaves alternate, doubly pinnately compound, very large; leaflets ovate, of medium size, acute, rounded at the base, short-stalked, entire; flowers of two kinds, greenish and inconspicuous; fruit a short, thick and broad, beanlike pod, with several suborbicular seeds.  
WINTER : tree, unarmed, with stout branches and a gray bark which appears as though of many small flakes rolled up on one edge; twigs thick, glossy, buds minute, superposed, set in tiny, silky craters, removed from the leaf scar as much as  $1/8$ " or more; leaf scars alternate, large, irregularly heart-shaped, little raised, with 3-5 large, rather indefinite bundle traces and sometimes with minute stipule scars fringed at the top.

*HALESTIA CAROLINA* \* is recognized in

SUMMER : a large shrub or small tree with the bark shredding and marked by whitish fissures; leaves alternate, simple, elliptic to ovate-oblong, finely serrate, acute or acuminate, base cuneate or rounded, estipular, tomentose at first, becoming glabrous above but remaining pubescent below; flowers white, often tinged pink, bell-shaped, puberulous, pendulous in axillary clusters on last year's wood; fruit an obovoid-oblong dry drupe with four longitudinal wings and with the tip elongated in a point.  
WINTER : bark gray or brown-gray marked with whitish fissures; twigs moderate, with a stellate-scurfy bark which shreds off in fine, hairlike threads; pith smallish, terete, white, finally chambered; leaf scars alternate, moderate, somewhat raised,  $\frac{1}{2}$ -round, notched, with one crescent-shaped bundle trace and no stipule scars; buds moderate, superposed, ovoid, with about four fleshy red scales.

**The Genus JUGLANS is distinguished in**

**SUMMER** : leaves alternate, pinnately compound, estipulate, with numerous, opposite leaflets, aromatic, serrate or entire; monoecious flowers in catkins, the staminate lateral and drooping, the pistillate in terminal racemes in the axils of bracts; fruit a nut with an indehiscent husk.

**WINTER** : trees with stout, more or less fluted twigs; pith chambered with rather close, thin plates; leaf scars alternate, rather large, shield-shaped or three lobed, raised, with 3 compound bundle traces and no stipule scars; buds moderate, sessile, velvety, with few scales, superposed, the terminal bud much larger than the lateral ones.

**Winter Key**

species	bark	pith	terminal bud	leaf scar	twigs	buds	pith diaphragms
<i>cinernea</i>	light gray with wide smooth <u>dark</u> margins	chocolate brown	elongated	with a downy ridge, not notched	moderate, pubescent, glandular	slender	
<i>sieboldiana</i>	dark, with rough ridges	creamy	elongated	with a downy ridge, and notched	very stout	stout	
<i>nigra</i>	"	"	short	without a downy ridge	gray-pubescent	canescent	close together
<i>regia</i>	light gray, smooth	"	"	"	glabrate	widely spaced (8 to 1")	

**Summer Key**

species	leaflets	pith diaphragms	terminal leaflet	fruit surface	nut	pith color
<i>regia</i>	entire or nearly so, glabrous, 7-9	widely spaced		glabrous	wrinkled but not rough, with thin partition	creamy
<i>nigra</i>	serrate	closely spaced	often not developed	glabrous	ridged, rough, with thick, bony partition	creamy
<i>sieboldiana</i>	"	"	well developed	sticky-hairy	rugose or nearly smooth	creamy
<i>cinernea</i>	glandular, pubescent, with spreading teeth	"	"	"	elongated, ridged	chocolate brown

*KALOPanax PICTUS* is recognized thus

**SUMMER** : a tree with stout, prickly branches; leaves alternate, simple, palmately veined and lobed, suborbicular, 5-7 lobed, with very long petioles, lobes acuminate and serrate; flowers small, whitish, in umbels; fruit a 2-seeded drupe, subglobose, bluish-black.  
**WINTER** : tree with coarse branches and thick twigs, armed with numerous short, stout prickles, these found both on nodes and internodes; twigs terete, often forming spurs; pith moderate, large, continuous, white; leaf scars alternate, narrowly crescent-shaped or U-shaped, somewhat raised, with 5 small bundle traces and no stipule scars; buds solitary, sessile, conical-ovoid, with about three, exposed, thin scales.

*KOELREUTERIA PANICULATA* is recognized thus

**SUMMER** : an unarmed small tree; leaves alternate, pinnately or bi-pinnately compound; leaflets 7-15, serrate, hairy, occasionally glabrous, coarsely and irregularly crenate-serrate, at the base often incisely lobed; flowers yellow, small, in large, loose panicles in midsummer; fruit an oblong-ovoid, 3-valved, bladdery capsule with papery walls and with 3 roundish, black seeds.  
**WINTER** : twigs moderate, orange-brown, lenticular; pith rounded, continuous, white; leaf scars alternate, raised, rather large, shield-shaped, with 3 compound bundle traces or a jagged, irregular series, and without stipule scars; buds moderate, solitary,  $\frac{1}{2}$ -ellipsoid, sessile, set at almost right angles to the twig, and with 2 exposed scales; end-bud lacking.

*LABURNUM ANAGYROIDES\** is recognized thus

**SUMMER** : leaves alternate, palmately compound, with 3 leaflets, petiolate; leaflets elliptic-obovate, ciliate with silky hairs, subsessile, obtuse, broadly cuneate; flowers yellow, in pendulous terminal racemes, pealike; fruit a legume, with a thick keel, appressed-pubescent, compressed, dehiscent.  
**WINTER** : twigs slender, green, appressed-pubescent, terete, or slightly fluted; leaf scars alternate or rarely opposite, small, elevated, transversely elliptical, with 3 bundle traces confluent or indistinct, and the stipules persistent on the leafy cushion; buds moderate, solitary, sessile, silvery silky-hairy, ovoid, with 2-4 outer scales scarred at the top.

The Genus *MALUS* is distinguished thus

SUMMER : trees without true spines but with often thornlike spurs; leaves alternate, simple, sometimes lobed, toothed on the margin, with small, soon falling stipules; flowers regular, in umbellike clusters; fruit a fleshy pome.

WINTER : twigs moderate, rounded, somewhat spinescent, usually dull, deep red in color; leaf scars alternate, raised, or the nodes swollen below them, linear or U-shaped, with  $\frac{1}{3}$  bundle traces keeled above and imbricate, end-bud sometimes lacking.

species	leaves in bud	calyx lobes	style	pedicels	leaves	flowers	fruit
prunifolia	rolled	persistent	longer than tube	—	dull, flat, sharply	calyx with a	ovoid
spectabilis	"	"	shorter than tube, acute	—	pubescent	fleshy base	attenuate
baccata	"	deciduous	longer than tube, narrow-lanceolate	—	lustrosp. broad	calyx pubescent	slender,
halliana	"	"	shorter than tube, triangular-ovate	4-5	glabrescent	glabrous, serrate	cuneate,
syvatica	folded	persistent	obtusish	—	glabrous	glabrous, serrate	slender,
ioensis	"	"	reflexed,	at base	" or less	above, serrate	slender,
angustifolia	"	"	tomentose erect	—	less	margins closely	slender,
coronaria	"	"	or spreading	"	or more	or entire	slender,
torin-goides	"	deciduous	glabrous	at base	tomentose below,	white, buds	slender,
floribunda	"	—	—	at base	crenate-serrate	cherry-red	slender,
arnoldiana	"	"	—	—	tomentose below	white or pink	slender,
schiedeckeri	"	—	—	—	lobed or strongly	white or pink	slender,
sargentii	"	"	—	—	serrate, doubly	white or pink	slender,
zumi	"	"	—	—	hard, thin	greened,	slender,
sieboldii	"	"	—	—	acute, doubly serrate	softed, greenish	slender,
				slender	hard, thin, oblong	greenish	slender,
				glabrous	glabrous, obtusish	greenish	slender,
				—	ovate, hard, thin	greenish	slender,
				slender	acute, doubly serrate, often lobed	greenish	slender,
				dull red	undifid, lobed	greenish	slender,
				glabrous	never lobed, cuneate, ovate or	intense carmine	slender,
				—	oblong, acute, serrate	in bud, pink	slender,
				connate to middle	irregularly serrate	very early	slender,
				—	"	first to bloom	slender,
				pubescent	pubescent	"	slender,
				glabrous	sharply serrate, pubescent	"	slender,
				—	often lobed, serrate	suborbicular	slender,
				—	habit low, spreading	petals, pink	slender,
				—	entire	marcescens	slender,
				—	only upper lobed	pink	slender,
				—	—	petals cuneate	slender,
				—	—	petals long	slender,
				—	—	sepals short	slender,
				—	—	as tube or long	slender,

The Genus *MORUS* is recognized thus  
 SUMMER : leaves alternate, simple or variously lobed, coarsely toothed, with 3-5 veins at the base, broadly ovate, with lanceolate, deciduous stipules; flowers in stalked, axillary, drooping catkins; fruit an aggregate of drupelike achenes, resembling a blackberry, sweet, edible.  
 WINTER : trees with a scant, milky sap; twigs moderate, terete, with a continuous pith; leaf scars alternate, round or half-round or rather triangular, slightly raised, with numerous bundle traces scattered or in an ellipse, and with narrow stipule scars, of which the one below the bud is the larger; buds sessile, solitary or laterally multiple, ovoid, oblique, with about 3-6 2-ranked thin scales; end-bud lacking.

species	leaves	buds	leaf base	bark	fruit	habit
alba	smooth above with axillary hairs, thin, glossy colored	triangular, ovoid, short, buff, yellow, scales uniformly colored			yellow to orange	white, pink, or purple, spreading tree
rubra	scarious above, pubescent beneath, closely, sharply serrate	buds more elongated, somewhat spreading, green scales dark-margined	truncate or slightly cordate	darker	ovoid to oblong	tree

*NYRICA CERIFERA* : see key for *Myrica* in shrub section.  
*NYSSA SYLVATICA* : is recognized thus

SUMMER : tree; leaves alternate, simple, obovate or oblong, entire, acute or obtusish, cuneate, lustrous above, glaucous beneath, glabrous; flowers inconspicuous, small, greenish on hairy peduncles, polygamo-dioecious, in axillary clusters; fruit an oblong-ovoid, blue drupe.  
 WINTER : mature branches spreading horizontally; twigs moderate, terete, glabrescent to glabrous; pith white, continuous, crossed by dia phragms; leaf scars alternate, broadly crescent-shaped or triangular, sometimes becoming U-shaped by rupture of a tegument, with 3 bundle traces and no stipule scars.

*OSTRYYA VIRGINIANA* is recognized thus

SUMMER : leaves medium sized, oblong-ovate to ovate, alternate, simple, pinnately veined, subcordate base, margin doubly serrate; flowers without perianth, the staminate pendulous, with 3-14 stamens, the pistillate aments, upright; fruit a ribbed nutlet in a bladderlike involucre with stiff hairs at the base, in a pendulous raceme.  
 WINTER : small tree with brown scaly bark which peels in long stripes; twigs slender, zigzag, with pale pith; leaf scars alternate, 2-ranked, slightly raised, small, crescent-shaped or  $\frac{1}{2}$ -elliptical, with 3 bundle traces and with elongated, unequal stipule scars; buds ovoid, pointed, with many imbricate scales in two rows, sessile, solitary, rarely superposed, oblique, end-bud lacking.

*PAULOWNIA TOMENTOSA*\* is recognized thus

SUMMER : tree; leaves opposite or whorled, large, ovate, palmately veined, hairy beneath, petiole often hollow, upper side pubescent, with minute cup-shaped glands at the base of the veins; flowers violet, in large panicles, fragrant; fruit an ovate, pointed capsule.  
 WINTER : twigs stout, resembling *Catalpa*, compressed at nodes; pith large, white, terete, chambered or excavated in the internodes; leaf scars opposite, subelliptical, more or less notched at top, raised, with many bundle traces in an almost completed ellipse, and no stipule scars.

The Genus PHELIODENDRON is recognized thus

SUMMER : by the opposite arrangement; leaves pinnately compound; leaves punctate with pellucid dots, aromatic with a turpentine-like odor; buds concealed in the base of the petiole; flowers dioecious, small, greenish, in terminal panicles or corymbs. WINTER : aromatic trees; bark yellow when cut; twigs moderate, terete, with a brown, continuous pith; leaf scars opposite or almost opposite, horseshoe shaped, raised, medium large, with 3 bundle traces which may be compound, and no stipule scars, naked, solitary, sessile, lustrous, silky red-brown, the silky hairs covering the overlapping of the two scales, flattened vertically and almost surrounded by the leaf scar.

#### Summer Key

species	margin	upper side of leaves	under side	base of leaflets	leaf rachis	inflorescence
amurense	ciliate	lustrous	Glabrous, Glauous — —	rounded		
sachalinense	not or sparingly ciliate	dull	Glabrous — —	cuneate or rounded		puberulous
Japonicum		dull	Gray-villous — —	truncate or subcordate, oblique		Glabrous

#### Winter Key

species	twig color	lower bark	twig texture	fruit clusters
amurense	orange	thick, corky, light gray	glabrous	
sachalinense	red-brown	thin, not corky, dark brown	glabrous	branched, winter buds red-downy
Japonicum	red-brown	thin, not corky, dark brown	pubescent	distinctly branched

The Genus *PLATANUS* is recognized thus

summer : arrangement alternate; leaves large, palmately 3-5 lobed, coarsely and acutely toothed; long petioled with the buds concealed in the base of the petiole, the stipules sheathing with the petiole margin; fruits in globose, long-stalked aggregates.

WINTER : large trees with the bark exfoliating in large, thin plates; twigs moderate, terete, glabrous, buff colored, zigzag, with a continuous pith; leaf scars alternate, 2-ranked, raised, scalloped, and completely encircling the buds, with 5 or more rather large bundle traces, and narrow stipule scars encircling the twig; buds solitary, sessile, large, conical, with a single closed scale; the end-bud lacking.

Summer and Winter Keys combined (fruit and bark constitute winter identification)

species	fruit heads	leaves	sinus	seeds	leaf	edgebase	bark	petioles
<i>orientalis</i>	racemose, 3 or more per 5 main veins, pedicel, bristly	usually with seldom 3	deep-cut	pointed	dentate	wedge or heart-shaped	scales very freely, greenish- white	green
<i>acerifolia</i>	two, racemose, bristly (rarely 3)	3-5 lobes, the middle lobe about as long as broad	—	—	coarsely toothed	truncate	scales freely	greenish white, mottled, young growth densely brown
<i>occidentalis</i>	usually solitary, smoothish	with 3 main veins (rarely 5), downy be- neath, lobes longer than broad	shallow	blunt	—	deeply cordate	scales less freely hardly at all from young trees, almost white	omentose

The Genus **POPULUS** is recognized thus

**SUMMER** : trees with a furrowed, light colored bark and rounded or angled twigs, and resinous buds, the terminal bud usually present; leaves alternate, long-stalked; petioles usually flattened, ovate, triangular or rhomboid in shape, margin dentate or serrate; flowers in pendulous catkins before the leaves; fruits ripening before leaves are fully out.

Summer Key

species	under side of leaves	buds	leaf form	leaf border	petioles	leaves	branches	leaf margin	leaf base
alba	white or gray	tomentose	lobed						
simoni	gray	glabrous	not	not	terete, compressed	rhombic-ovate to obovate, glabrous	angled	crenate-serrulate	cuneate
deltoides	white	tomentose	not	not	long	broadly deltoid-ovate	not "	coarsely crenate-serrate, curved	truncate, entire
tremuloides	"	glabrous	waxy	"	"	ovate to orbicular, short	"	finely glandular-serrate	cordate or subcordate
grandidentata	"	"	"	"	"	acuminate, small, thin, less than 3"	"		
nigra	"	"	"	"	"	ovate, large 3-5" long	"		
candidans*	"	"	"	"	"	slightly sinuate-dentate, teeth callus-mucronate			

The Genus **POPULUS** is recognized thus  
**WINTER** : deciduous trees with the upper bark smooth and colored greenish, or whitish or orange, and  
 the lower bark gray and deeply fissured; twigs moderate or coarse, terete or 5-angled; pith  
 rather small, 5-angled, brownish, almost continuous; leaf scars alternate, on raised cushions,  
 broadly crescent shaped or triangular, inclined to be 3-lobed, with 3 bundle traces and  
 narrow stipule scars; buds moderate to small, the terminal one enlarged, appressed or curved  
 out, sessile, solitary, with the lowermost scale centered over the leaf scar, usually resin-  
 ous; terminal bud present; catkin scales laciniate.

Winter Key

species	twigs	buds	lateral buds	branchlets	bark
alba	white-downy	white downy		white downy when young	whitish or greenish-gray
simoni	glabrous, ridged or angled	pointed, erect, not white-downy		yellowish, slender, terete, angled	yellow-gray
grandidentata	gray-tomentose at first, then glabrous	puberulous to pubescent, dusty, ovoid	widely divergent	red-brown, rather coarse	upper bark light, greenish
tremuloides	gray-tomentose at first, then glabrous, not ridged	ovoid, pointed, glabrous, lustrous, slightly viscid	more or less appressed, plump	red-brown, slender	upper bark light, greenish
deltoides	glabrous, not ridged	very long, sticky-resinous, pointed, brownish	not fragrant	usually yellow, crooked and distorted	upper bark orange
candidans*	terete, glabrous	"	fragrant	red-brown, not so distorted	upper bark orange
nigra	glabrous, terete	elongated, viscid, red-brown, curving out at apex	not fragrant, curving out at apex	orange to ash-gray	upper bark orange

**The Genus Prunus** is recognized thus  
SUMMER : leaves alternate, serrate, stipulate; flowers solitary, fascicled, or in racemes, floral parts in 5's, perfect, usually white or pink or red, with numerous stamens and one pistil;

WINTER : trees or shrubs having a characteristic bark with long, prominent lenticels, usually almond flavored; twigs slender or moderate, rounded or angled from the nodes, pith continuous; leaf scars alternate, small, half-round or half-elliptical, with 3 minute bundle traces subtended by stipule scars or by the remains of the stipules; buds usually collaterally multistipulate or occasionally solitary, slender ovoid, sessile, with about 6 exposed scales; end-bud sometimes lacking; leaf scars raised on a cushion.

#### Key to Sub-Genera

group	terminal bud	axillary leaves	flowers and fruit	fruit	stone	buds
I plums	lacking, scar left	solitary	rolled in bud	few, in umbels, with the leaves from winter-buds pedicelled, glabrous	compressed, not furrowed	longer than broad
II apricots	"	"	finely serrate, pairs, before leaves, the bud	lengthwise, pubescent, pedicel separating at or before maturity	smooth, margin grooved	
III almonds and peaches	present	3, lateral ones flower buds	folded in sessile, rarely stalked, solitary bud, petiole usually glandular	very pubescent, pedicel separating at maturity	furrowed and pitted	round ovoid
IV umbelliferous cherries	"	"	"	in umbels or solitary, with the leaves from winter buds	globular, small, globular	
V racemose cherries	"	"	"	terminal racemes elongated, with the leaves, flowers small, white	globular, small, globular, peduncle usually leafy	"

Summer and Winter Keys combined

PLUMS

species	leaves	veins	under side of leaves	fruit	buds	twigs	foliage	petiole	terminal bud
<i>domestica</i>	broad, net-veined, numerous, at a wide angle	pubescent	elliptical pubescent	blue-black	light brown	glabrous	without glands	"	lacking
<i>cerasifera</i>	"	glabrous	light brown	yellow or velvety, acute	glabrous	slender, red-brown	green	"	"
<i>cerasifera</i>	broad-ovate, acuminate	"	"	dark red	glabrous	darker than above	dark purple	"	"
<i>pissardi</i>				wine-red					

ALMONDS & PEACHES

species	fruit	habit	leaves	bud	twigs	stipules	petioles	fruit stone
<i>persica</i>	pubescent at maturity	tree	oblong-lanceolate, glabrous, serrate	hairy	red	glabrous	glandular	deeply pitted
<i>triloba</i>	"	shrubby	broad-ovate, tends to be 3-lobed, deeply serrate	glabrate	dark brown	persistently broken	"	with thick, bony shell
<i>davidiana</i>	tree	"	ovate-lanceolate, long acuminate, finely serrate, glabrous	"	glabrous, red-brown	deeply fringed	glands underdeveloped	free, small pitted

UMBELLATE CHERRIES

species	buds	fruit	foliage	twigs	habit	buds	stipules	bud form	leaves
<i>tomentosa</i>	three together	glabrate, red at maturity, almost sessile	tomentose beneath	hairy	very dark shrubby tree	clustered loosely hairy	persistent or broken bristlelike	loosely scaled, acute	crowded, rugose dull, ovate, or elliptic, unequally serrate
<i>glandulosa</i>	"	subglobose, red, glabrous	pedicels about $\frac{1}{2}$ in. long	glabrous beneath or slightly puberulous	shrubby	sessile or stalked	"	ovate-oblong-lanceolate acute crenate-serrate	ovate to oblong-lanceolate
<i>avium</i>	solitary	glabrous pedicels red	not tomentose	glabrous	tall tree	on short spurs	"	ovoid-globose	ovoid-globose
<i>cerasus</i>	"	sepal's reflexed	"	"	"	"	"	drooping	drooping
<i>subhirtella</i>		involute, persis-	hairy pubescent		when young			ovate, abruptly	short-pointed
		tent black, sepals	when young					stiff spreading	oblong-ovate on
		erect or spreading,						doubly acuminate,	doubly serrate
		emarginate						teeth short	

**PRUNUS - continued**

**RACEMOSE CHERRIES**

species	habit	foliage	fruit	bud	twigs	leaves	bark	flowers	calyx
<i>pennsylvanica</i>	tree	glabrous	sub-umbellate, red, sour	straw-colored	red, shining slender	oblong-lanceolate, finely serrate, to wine-red	erect at 1st petal's same length as stamens		deciduous
<i>virginiana</i>	"	"	dark red, astringent	dull light brown, scales	red-brown glabrous	elliptic to obovate, glaucous beneath	grayish	"	deciduous
<i>padus</i>	"	"	black	dark red, astringent	oblong, brown	oval-oblong, soft, serrate, abruptly acuminate, grayed beneath	"	large, spreading or drooping, petals twice length of stamens	glabrous outside
<i>serotina</i>	"	"		smooth	appressed, smooth	velvety, brown	brown	large, spreading or drooping, petals twice length of stamens	deciduous
				pit rugose				small in long racemes	tube pubescent inside

N.B. *Prunus padus* is very like *P. virginiana* but has larger flowers on longer pedicels, in racemes which are looser, often drooping, and somewhat leafy. (from L.H.Bailey)

**PYRUS COMMUNIS** is recognized thus

**SUMMER** : leaves alternate, simple, toothed but not lobed, petiolate, stipulate, crenate-serrulate, orbicular-ovate to oblong-ovate, subcordate to broad cuneate, glabrous, with a hard and lustrous surface; flowers fairly large, white with brownish stamens, long-pedicelled, nearly glabrous; fruit pyriform, pome, with grit cells.

**WINTER** : a broad pyramidal tree, the young branchlets glabrous, occasionally ending in spines; twigs moderate, terete, with numerous spurlike fruiting branchlets, lenticels conspicuous, swollen beneath them, shining; leaf scars alternate, somewhat raised or the nodes bud's moderate, solitary, sessile, with about 4 mucronate scales more or less keeled above; end-bud sometimes lacking.

**PRUNUS - cont'd** --- **PYRUS**

The Genus *QUERCUS* is recognized in  
SUMMER : leaves short-petioled, pinnately veined, simple or lobed, margin toothed or rarely entire; staminate flowers in catkins; fruit an acorn; buds multiple at ends of twigs, with many scales, lateral buds generally smaller and solitary; twigs fluted.

species	fruit	lobes	leaves	bark	fruit	leaf form	buds	acorn cup	leaf base	leaf surface
marian- dica	matures second season	acute bristle tipped	deep-cut or lobed	deeply furrowed, scaly, inner bark not yellow	ovovate	broadly obovate	rusty hairy	scales rusty tomentose	rounded	brown tomentose beneath
veluti- na	"	"	" thick, leathery	cut in near square plates, inner yellow	ovovate	to oblong	hoary tomentose, angular	scales hoary pubescent	cuneate to truncate	pubescent to glabrous beneath
ellipsoi- dalis	"	"	deep-cut or lobed	inner bark yellow	elliptic	lustrious, slightly angular	ellipsoid, brown hairy	truncate or broad cuneate	truncate	glabrous beneath, lustrous above
coccinea	"	"	deep-cut lobed thin	inner bark red	elliptic	not angular, with O-shaped pubescent	upper half elliptic	truncate or broad cuneate	"	"
palustris	"	"	"		elliptic	sinus and lobe sides parallel	saucer-shaped	cuneate	"	"
borealis	"	"			oblong	sinus broad spreading	glabrous apex	cuneate	glabrous beneath, dull above	"
maxima	"	"			linear-oblong	long to lanceolate	oblong	cuneate	glabrate beneath	"
phellos	"	"	entire not lobed		nearly sessile	sessile	turbinate	cuneate	pubescent beneath	"
imbrica- ria	"	"	" margin thickened	firm	peduncle short	oblong	oblong	cuneate	gray tomentose beneath	"
bicolor	matures pointed	sinuate not lobed	thin scaly curling	petiolate obovate, sessile or short stalked	long	oblong	turbinate	cuneate	rounded	"
muhlen- bergii	firson	"	not cut or lobed	not scaly curling	long	oblong	oblong	cuneate	gray tomentose beneath	"
prinus	"	"	"		oblong	oblong	oblong	cuneate	gray hairy beneath	"
prinoides	"	"	teethish	habit shrubby	oblong	oblong	oblong	cuneate	tomentose beneath	"
macrocar- pa	rounded	lower half corky- ridged	habit	oblong	oblong	oblong	oblong	fringed	gray hairy beneath	"
alba	"	"	upper tan-shaped	not corky-ridged	oblong	oblong	oblong	cuneate	glauous beneath	"
robur	"	"	deepcut, rounded	petioles short	very short	petioles longer	petioles longer	auriculate	"	"

The Genus **QUERCUS** is recognized in

**WINTER** : twigs moderate, fluted; pith star-shaped in cross section; leaf scars multiple, rather small, half round, slightly elevated, with 10 or 12 scattered bundle traces and small stipule scars; buds solitary or laterally multiple, sessile, globose, ovoid, or conical, with numerous 5-ranked scales.

species	twigs	acorn	branch buds	acorn cup	fruit pedicel	bark	bud scales	nut	bud apex	twig color
macrocarpa	thick, tomentose	sweet, matures 1st season	corky, ridged all over	1/8" ellipsoid, pale pubescent at rim	fringed					gray-pubescent
bicolor	glabrous	"	shaggy 1/8" only upper pubescent, conical, slightly grooved	not fringed	1" long pubescent	thin, scaly				
prinoides	prinoides	"	"	ovoid or conical, hot fringed	short, stout	light gray	pale marginated	oblong, acute	acute	gray
muhlenbergii	"	"	"	ovoid, brown' puberulent or glabrous	"	flaky	acute	acute	acute	purple
alba	"	"	"	conical, only up to 1/8", pubescent	short	light gray	acute	acute	acute	gray
robur	"	"	"	ovoid, red-brown, terete, glabrous	"	tree form	oblong	oblong	obtuse	gray or reddish
imbricaria	glabrescens	matures 2nd season	"	1/8", stout, ovoid, dark brown, slightly angular, lateral buds	long	dark gray	acute	acute	acute	gray
palustris	glabrous	"	"	widely divergent	"	firm	acute	acute	acute	purple
phellos	"	"	"	lustrous, lateral	"	not pale	acute	acute	acute	gray
borealis	maxima	"	"	medium, small, brown, glabrous	"	marginated	acute	acute	acute	purple
ellipticalis	"	"	"	large, glabrous	"	not marginated	acute	acute	acute	purple
marilandica	puberulenta	"	"	lustrous, more or less appressed	"	acute	acute	acute	acute	purple
velutina	glabrous	"	"	medium, small, brown, acute	"	acute	acute	acute	acute	purple
coccinea	"	"	"	lustrous	inner	acute	acute	acute	acute	purple
				1/8", glabrous, lust-narrow	light	acute	acute	acute	acute	purple
				irous, pubescent	yellow	acute	acute	acute	acute	purple
				conical-fusiform	acute	acute	acute	acute	acute	purple
				rusty-hairy	acute	acute	acute	acute	acute	purple
				hoary tomentose, angular, large	acute	acute	acute	acute	acute	purple
				ovoid	acute	acute	acute	acute	acute	purple
				upper half pubescent, dark red-brown	acute	acute	acute	acute	acute	purple

The Genus ROBINIA is recognized thus

SUMMER : leaves pinnately compound, alternate, petiolate, stipulate; leaflets opposite, short stalked, with stipule-like appendages (stipels), elliptic; flowers in racemes, pealike; fruit a pod, 2-valved, flat, linear-oblong, with several seeds.

WINTER : trees or shrubs; twigs zigzag, more or less angular, with two prickles at each node, pith round, brownish, continuous; leaf scars alternate, broadly triangular or 3-lobed, with 3 bundle traces; stipules persistent in the form of paired spines; buds small, superposed, covered by a membrane; end-bud lacking.

Summer Key

species	flowers	branchlets	fruits	leaflets
<i>pseudoacacia</i>	white	glabrous	smooth pods	elliptic or ovate, 7-19 glabrous
<i>hispida</i>	pink to purple	hispid, sometimes glabrous	—	less than 15, glabrous, suborbicular to oval, apex rounded
<i>viscosa</i>	"	glandular-viscid	—	more than 15, ovate rachis glandular or viscid

Winter Key

species	habit	twigs	thorns
<i>hispida</i>	shrubby	very bristly, not viscid nor glandular	—
<i>viscosa</i>	tree	densely glandular-viscid	stipular thorns small or lacking
<i>pseudoacacia</i>	tree	glabrous, not glandular	2 stipular prickles at each node



The Genus *SALIX* is much involved and exceedingly difficult to identify absolutely. But it is possible to know the species in this chart sufficiently to recognize them readily in summer and fairly well in winter. *SALIX* is usually identified by the buds which have one bud scale opening on the inside next the stipule; flowers in emarginations; fruit a 2-valved capsule, formed in spring.

species	habit	leaves	fruit	number of stamens	petioles	twigs	flowers	stipules	buds
<i>babylonica</i>	decidedly pendulous	lanceolate, finely serrate, glabrous, glaucous beneath			not glandular	olive-green, not bloomy			
<i>alba</i>	large tree	lanceolate, serrate, pubescent beneath		two	—	obscurely glandular	green or brown		
<i>vitellina</i>	"	"		"	"	"	bright yellow		
<i>nigra</i>	"	linear-lanceolate, closely serrate, glabrous, green both sides		3-5	not glandular & slender & terete				
<i>amygdaloidea</i>	"	lanceolate, serrate, glaucous beneath		"	not glandular slender, terete				
<i>incana</i>	often shrubby	lanceolate, revolute, white tomentose beneath			glandless	villous, reddish brown	before leaves on winter branches	lacking	
<i>caprea</i>	"	broad & short, white tomentose beneath		"	red and green	blackish with a red cast		prominent	large, stout, red
<i>discolor</i>	"	oblong to obovate, serrate, acuminate, cuneate, glaucous		"	"	"			large, slender, almost black
<i>pentandra</i>	"	broad ovate to long-ovate, smooth, glossy, glandular-serrate, fragrant when bruised, acuminate		more than 3	lustrous straw color, cordate, base tapering gradually	polished with or after leaves, on short, lateral leafy shoots			more slender, but
<i>lucida</i>	"	ovate-lanceolate, pubescent at first, later glossy, broad & smooth, serrate, long-acuminate glabrous		"	dull straw-colored or cuneate, bottle-necked	duller green	"	larger	

WINTER identification for the Genus **SALIX**  
 shrubs or trees; young bark smooth and colorful, green, gray, yellow, or red; twigs very flexible  
 lustrous, slender, terete, with a continuous pith; leaf scars alternate, low, U-shaped, with 3  
 bundle traces; stipule scars short or wanting; buds mostly small, oblong, appressed, sessile, sol-  
 itary, with a single scale opening on the inside next the twig.

species	habit	twigs	twig color	lateral buds	catkins
<i>babylonica</i>	tree, pendulous	slender, whiplike	yellowish		
<i>alba</i>	erect tree	slender, flexible, break easily	greenish	appressed, gibbous	
<i>vitellina</i>	"	"	bright yellow	"	
<i>nigra</i>	"	"	bright red-brown	"	
<i>amygdaloidea</i>	"	"	glabrous or pubescent	"	
<i>incana</i>	shrubby	slender, dense, very flexible	dark orange or red-brown, lustrous	dark brown, gibbous, broad-ovoid, ridged, lustrous	
<i>caprea</i>	ascending	more stout, flexible	quite red	red, appressed, gibbous	
<i>discolor</i>	spreading	slender, flexible	green, tinged red	very large, ovoid, stout, scale reddish	
<i>pentandra</i>	tree	"	brown	large but long and slender	
<i>lucida</i>	shrub or tree not so tall as <i>S. pentandra</i>	"	brownish-green, lustrous, viscid in youth, polished green or yellow-brown	metallic black tinged red	small, after the leaves large, with the leaves

**SALIX** -- Winter Key

Sassafras varifolium is recognized thus

**SUMMER** : leaves alternate, simple or 1-3 lobed, entire, 3-veined at the base, distinctively flavored and mucilaginous; branchlets and buds glabrous green and glaucous; flowers dioecious, pale yellow; fruit an ovoid blue drupe on a fleshy carmine pedicel.

**WINTER** : trees with orange bark and green twigs, freely suckering; aromatic; twigs moderate, with nodes shortened near the tips; pith slightly angled, continuous; leaf scars small,  $\frac{1}{2}$ -round or crescent shaped, somewhat raised, with a linear bundle trace which may be broken into 3 and without stipule scars; buds solitary, sessile, ovoid, with about 4 fleshy scales; the end-bud enlarged.

**SALIX**, Winter Key -- SASSAFRAS

**SOPHORA JAPONICA** is recognized thus

**SUMMER** : Leaves alternate, pinnately compound, with 7-17 leaflets, petiolate, with small stipules; leaflets opposite, small, ovate, acute, glaucous beneath, slightly stalked; flowers yellowish, pealike, in panicles; fruit an indehiscent pod, terete but constricted between the several seeds; young branchlets green.

**WINTER** : usually trees; twigs moderate, swollen at the nodes with long internodes, zigzag, angled, green and glabrous; pith triangular, greenish; leaf scars alternate, raised, with an articular membrane which when torn leaves the scars U-shaped, with 3 bundle traces and with stipule scars; buds superposed, sessile, indistinctly scaly, woolly, at first concealed by a membrane; the end-bud lacking; odor strong and offensive when cut or bruised.

The Genus **SORBUS** is recognized thus

**SUMMER** : Leaves alternate, stipulate, pinnately compound or pinnatifid, serrate; flowers small, white, in terminal, compound corymbs, white, floral parts in 5's; fruit a small red pome clustered near the tip,  $\frac{1}{2}$ -round, little raised, with 3 bundle traces; leaf scars alternate, buds solitary, sessile; lateral buds mostly suppressed, terminal bud rather large, long-ovoid, with about 4 pointed scales.

**WINTER** : small trees with a smooth bark; twigs moderate with a continuous pith; leaf scars alternate, clustered near the tip,  $\frac{1}{2}$ -round, little raised, with 3 bundle traces, and without stipule scars; buds sessile, lateral buds mostly suppressed, terminal bud rather large, long-ovoid, with about 4 pointed scales.

Summer Key

species	leaves	leaflets	leaflet tip	fruit
<i>quercifolia</i>	pinnately cleft			
<i>americana</i>	pinnately compound	11-17, lanceolate	long acuminate	orange-red
<i>aucuparia</i>	"	7-15, oval to ovate-lanceolate	acute	darker, deep red

Winter Key

species	buds	bundle traces	
<i>americana</i>	elongated, gummy	five	
<i>aucuparia</i>	elongated, woolly	five	
<i>quercifolia</i>	elongated, woolly	three	

**SORBUS** -- Winter Key

**SORBUS** -- Summer Key

The Genus **TILLA** is recognized thus  
 SUMMER : leaves alternate, simple, 2-ranked, slender long-petioled, broadly ovate, oblique at the base, serrate; flowers in drooping cymes from the midrib of a long and narrow leaf-like bract, creamy-white and very fragrant, the source of the finest honey; fruit globose, nut-like.

Summer Key

species	flowers	leaves	habit	veins	leaf surface	twigs	buds
americana	with staminodes	essentially glabrous, glossy beneath			glabrous, greenish, tinged red	glabrous, stout, dark red	
heterophylla	"	dense tomentose beneath, often brown			glabrous, moderate, red	glabrous, moderate, deep red	
tomentosa	"	white tomentose beneath	erect		tomentose	tomentose	
peltiolaris	"	"	pendulous		"	"	"
cordata	without staminodes	glaucous beneath, small		with axillary hairs, triple veins	glabrous, slender	glabrous, small	
euchlora	"	glabrous with tufts of hair beneath		not pronounced	glossy	glabrous	
europaea	"	glabrous, glaucous with tufts of hair beneath	medium size		dull	glabrous, numerous slender	glabrous
platyphyllos	"	pubescent beneath				loosely hairy	loosely hairy

*Tilia cordata* and *Tilia europaea* have conspicuous axillary tufts of hairs at the base of the blade on the under side.

The Genus *TILIA* is recognized thus

**WINTER** ; twigs moderate, zigzag, rounded, with rather long internodes; leaf scars alternate, 2-ranked, half-elliptical, a little elevated, with 3 bundle traces which are usually compound, and with unequal stipule scars; buds solitary, sessile, rather largish, lop-sided, ovoid, with 2-3 greenish or red lustrous scales; the end-bud lacking.

#### Winter Key

species	twigs	hairiness	habit	shell of fruit	branchlets	twig color	bark
<i>platyphyllos</i>	hairy	loose, sparse	erect	5-angled			gray streaked black
<i>tomentosa</i>	"	densely tomentulose	drooping	5-furrowed			
<i>petiolaris</i>	"	"					
<i>cordata</i>	glabrous	----		thin, fragile	slender, very twiggy		
<i>europaea</i>	"	----		thick	subglobose slender less twiggy		almost black
<i>euchlora</i>	"	----			elliptoidal	"	
<i>heterophylla</i>	"	----		"	moderate	blood-red	
<i>americana</i>	"	----		"	stout	reddish on the upper side	

N.B. *Tilia platyphyllos* is included in this key for the sake of distinction but further discussion of it is omitted since it seems less desirable than the others for landscape use. It is occasionally sold as *T. europaea* (*vulgaris*). In its youth it appears very fine, better than *europaea*, dense and shapely. It leafs out early and flourishingly, but in later growth and habit it has many disadvantages such as frost-cracking and sooty deposit plus a serious summer infestation of red spider which quickly yellows the foliage and causes it to drop. For that reason it is better to avoid planting this species. *T. euchlora* is rapid in growth and hardy, but it appears to suffer in much the same way as *platyphyllos*; so again we include it in the key only for the sake of identification, but omit much data.

URTICACEAE

1. Fruit a one-seeded samara, winged, in clusters; bark with flattened ridges; leaves usually doubly serrate, with base oblique; winter buds spreading with scales in 2 ranks. . . . . *Ulmus*
2. Fruit a short-stalked drupe; branches never spiny; bark smoothish, scaly; leaves singly serrate, with base symmetrical, subcordate; winter buds spreading with scales in 4 ranks. . . . . *Zelkova*
3. Fruit an oblong, berrylike drupe with a sweetish, date-like flavor; bark light gray with deep, corky ridges; winter buds appressed . . . . . *Celtis*

The Genus *ULMUS* is recognized thus  
SUMMER : leaves 2-ranked, alternate, simple, thickish, dark green, usually doubly serrate, oblique at the base; twigs slender, zigzag, 2-ranked; leaf scars raised very little, broadly crescent shaped, with 3 bundle traces and unequal stipule scars.

species	leaves	fruit	flowers	bark of branches	twigs	buds	leaf margin
<i>racemosa</i>	essentially smooth hairy all over both sides	in pendulous racemes		often corky	pubescent	large, pilose	doubly serrate
<i>glabra</i>	"	glabrous	dense clusters	not corky, smooth	hispid- pubescent	large, hairy, 4 scales	"
<i>carpini- folia</i>	as above & lustrous	glabrous	"	"	glabrous	large, minutely pubescent	"
<i>americana</i>	rough above, soft pubes- cent below	hairy around edge	on long slender pedicels, pendulous	rough	glabrous	small, glabrous	"
<i>fulva</i>	scabrous both sides	hairy only over seed	short pedicelled, in dense clusters	rough, occasionally corky	rough hairy	large, rusty tomentose	"
<i>procera</i>	rough both sides	glabrous	short pedicelled in dense clusters	rough, occasionally corky	glabrescent	large, pubescent	"
<i>pumila</i>	glabrous, obliquely obovate	very short stalked	not pendulous	smooth	slightly pubescent, slender	tiny, hairy with 4 scales	singly serrate

**The Genus ULMUS** is recognized thus  
in WINTER: twigs slender, terete, zigzag, 2-ranked in one plane; pith small, rounded, continuous; buds  
solitary, 2-ranked, ovoid, obtuse; bud-scales obtuse; leaf scars scarcely raised,  
broadly crescent-shaped, with 3 bundle-traces and unequal stipule scars.

N.B. usually the twig in winter and the leaf in summer are sufficient identification.

**Winter Key**

species	inner bark	buds	bark structure	twigs	branchlets	bud size	bud scales	roots
<i>fulva</i>	mucilaginous	brown	red all through	scabrous				
<i>americana</i>	not mucilaginous	tomentose	with white layers	glabrous				
<i>racemosa</i>	"	pale pubescent or glabrous						
<i>carpinifolia</i>	"	large, pilose	uniform all through	corky, pubescent				
<i>pumila</i>	"	large, more or less hairy	"	not corky	glabrous			
<i>glabra</i>	"	very small, scales ciliate	"	"	slightly pubescent	tiny, oblique	four visible	
<i>procera</i>	"	large, blackish-red	"	"	hairy while young	large	four visible	not suckering
		"	"	"	occasionally with corky wings	large	four or more	suckering

KEY TO THE SHRUBS IN WINTER

A. leaf scars whorled (three at a node) or opposite.

Pith small, angular; buds in depressed pockets, indistinctly scaly; stipule scars evident . . . . . *Cephalanthus*

Pith large, roundish; buds not in depressed pockets and with distinct scales; without stipule scars . . . . . *Hydrangea*

Pith brown, excavated . . . . . *Deutzia*

AA. Leaf scars opposite (two at a node).

Branchlets and twigs densely clothed with silvery or brown scales. *Shepherdia*

Branchlets and twigs not clothed with scales.

Twigs spinescent . . . . . *Rhamnus*

Twigs not spinescent.

Branchlets enlarged at the nodes and flattened; buds superposed in a single-budlike aggregate; leaf-scar horseshoe shaped; parts aromatic when bruised . . . . . *Calycanthus*

Nodes not especially enlarged nor flattened.

Buds naked or with a single scale or a sac of two closely united scales, short, fat, and gummy within . . . . . *Viburnum*

Buds with several scales.

b. Buds stalked.

Lateral buds often concealed by a persistent petiole base; buds oblong and stalked; leaf scars connected by a concave line . . . . . *Cornus*

Lateral buds evident though small; leaf scars meeting or almost so, though not connected . . . . . *Viburnum*

bb. buds sessile.

c. outer bark freely peeling.

Twigs and buds densely rusty-tomentose . . . . *Hydrangea*

Twigs and buds not rusty-tomentose.

Young growth orange-colored; buds concealed under a membrane . . . . . *Philadelphus*

Not orange-colored and buds not concealed.

Buds sometimes superposed.

Leaf scars on the tips of raised bases . *Lonicera*

Leaf scars not or slightly raised . . . *Viburnum*

Buds not superposed.

Twigs very hairy; buds gray-velvety . . . *Kolkwitzia*

Twigs and buds glabrous or glabrescent.

Pith spongy or excavated . . . . . *Deutzia*

Pith continuous . . . . . *Viburnum*

cc. outer bark firm

d. leaf scars with three bundle traces.

e. scars large and broad.

Twigs stout, terete; buds solitary; end-bud enlarged . . . . . *Aesculus*

Twigs angled and with a very large, soft pith; scars sometimes with 5-7 bundle traces; buds multiple . . . . . *Sambucus*

ee. scars moderate or small.

Leaf scars hairy at the top . . . . . *Rhodotypos*

Leaf scars not hairy at the top.

Twigs with 2-4 hairy, raised lines . . . *Weigela*

Twigs without hairy, raised lines.

f. Twigs green.

Twigs bright green; buds silvery, silky-hairy . . . . . *Laburnum*

Twigs olive-green, lustrous; buds glabrous, with few scales; end-bud lacking; fruit an inflated bladderlike pod . . . . . *Staphylea*

ff. Twigs not green.

Twigs relatively coarse, with a large pith . . . . . *Hydrangea*

Twigs and pith moderate.

Leaf scars frequently alternate, half-elliptical or crescent-shaped . . . . . *Rhamnus*

Leaf scars always opposite.

Buds more or less appressed . . . . . *Viburnum*

Buds not appressed.

Leaf scars on the narrowed ends of raised bases; buds at a very broad angle with the twig . . . . . *Lonicera*

Leaf scars only slightly raised; angle of bud acute . . . . . *Deutzia*

dd. Leaf scars with only one bundle trace, or with many traces scattered or in an ellipse or nearly confluent in a line (includes cases where the traces are indistinguishable in a shrivelled scar)

g. soft, pithy half-shrubs with superposed buds.

Scars triangular or crescent-shaped . . . . . *Buddleia*

Scars and bundle-traces C-shaped . . . . . *Callicarpa*

gg. not as above.

h. Pith finally chambered or excavated.

Twigs distinctly ridged or winged . . . . . *Euonymus*

Twigs not distinctly ridged or winged.

Buds slender, moderate, finally multiple; twigs yellow-buff . . . . . *Forsythia*

Buds small.

Leaf scars small, ragged, raised, and shrivelled . . . . . *Symporicarpus*

Leaf scars moderate, distinct, low and diamond-shaped; twigs angled below the nodes . . . . . *Hypericum*

hh. Pith continuous and persistent.

Twigs angular or grooved below the nodes.

i. leaf scars relatively broad.

Buds superposed, scales stiff-pointed. *Chionanthus*

Buds not superposed, scales not stiff-pointed . . . . . *Syringa*

ii. Leaf scars small or minute, elevated.

scars shrivelled . . . . . *Symporicarpus*

Twigs terete; scars small, elevated, distinctly outlined and without stipule scars . *Ligustrum*

AAA. Leaf scars alternate (one at a node)

j. stems with twig spines.

k. densely clothed with silvery or brown scales.

End-bud often present, twigs moderate; buds with about four exposed scales; thorns lateral . . . . . *Elaeagnus*

End-bud lacking; twigs slender, ending in spines; buds with two exposed scales . . . . . *Hippophae*

kk. Not clothed with scales.

Twigs puberulent, green or brownish; buds solitary . . . *Ceanothus*

Twigs glabrous; buds small.

Twigs whitish or short striate, 5-angled; buds inconspicuously multiple; habit scrambling . . . . . *Lycium*

Twigs orange or reddish, rigid; buds becoming conspicuously multiple; twig spines axillary . . . . . *Cydonia*

jj. stems with prickles (superficial outgrowths)

l. Prickles below the nodes or scars.

m. Twigs grooved or furrowed.

With branched or slender leaf-spines and fascicled leaves or scars . . . . . *Berberis*

Buds developing a green grooved spine and stipules . . . *Genista*

mm. Twigs not grooved or furrowed.

n. Twigs with 1-3 prickles below each narrow leaf scar.

Twigs light-colored, moderate; bundle-traces 5; buds sessile with about 3 exposed scales . . . . . *Acanthopanax*

Twigs darker; bundle traces 3; buds with several loose scales . . . . . *Ribes*

nn. Twigs with numerous stout, curved thorns below the nodes;  
 twigs very coarse . . . . . Aralia

11. Prickles scattered (not all at the nodes).  
 Young twigs angular or ridged, and with paired stipular  
 thorns . . . . . Robinia

Twigs terete; prickles slender or recurved . . . . . Rosa

111. Prickles beside the bud (stipules)  
 Twigs and buds pungently aromatic; buds rusty-red . . . Zanthoxylum  
 Not pungently aromatic (or at least only the stipules so).  
 Paired prickles becoming coarse and strong; twigs strongly  
 ridged near the tip and colored orange and green; buds  
 superposed beneath a membrane . . . . . Robinia

Paired prickles small, remaining weaker.  
 Twigs green, with 3 decurrent ridges beneath the leaf-scars  
 Caragana

Twigs not green nor with decurrent ridges; leaf scars torn  
 and shrivelled on much raised petiole bases; leaf bases  
 not overlapping . . . . . Rubus

jjj. Without prickles or spines (unarmed).  
 Densely clothed with silvery or brown scales; buds with 4 exposed  
 scales . . . . . Elaeagnus

Not as above.  
 Twigs terete, fluted near the tip and terminating in a dilated  
 flattened tip with several bud and fruit scars . . . . Hibiscus  
 Twigs not fluted near the tip nor terminating in fruit scars.

k'. Buds naked.  
 Fruit a 2-celled woody capsule . . . . . Hamamelis  
 Fruit a small drupe . . . . . Rhamnus

kk'. Buds not naked.  
 Stems brownish-yellow overcast with a leaden color near  
 the tips; buds a little elongated, pointed, and loose.  
 Clethra

Stems not as above.

o. Stems and buds spicily and pungently aromatic.  
 Buds rather small, superposed, the upper flower-  
 buds collaterally doubled and stalked . . . . Benzoin

Buds not superposed nor multiple.  
 p. Young twigs resinous-dotted.  
 With stipule scars . . . . . Comptonia  
 (see Myrica key)

Without stipule scars . . . . . Myrica

pp. Young twigs not resinous-dotted; coarse  
 or else hairy or glaucous . . . . . Rhus

oo. Not aromatic.

q. Twigs, stems, and branches green.  
 With a narrow scar completely encircling the  
 twig at each node . . . . . Magnolia  
 Without such scar.

r. stems definitely and positively ridged.  
 Buds small, encased in hardened greenish  
 resin; ridges about eight . . . . . Baccharis  
 Buds not resinous; branches smooth.  
 Scars with 3 bundle traces; pith rela-  
 tively large . . . . . Kerria  
 Scars with one indistinct bundle trace;  
 pith small.  
 Some buds producing a green,  
 grooved spine . . . . . Genista

Buds not becoming spines . . . . Cytisus

rr. Stems not positively ridged.  
 Buds with a single scale opening on the  
 inside next the twig . . . . . Salix  
 Buds with more than one scale, more or  
 less stalked . . . . . Cornus

qq. Twigs and stems not green  
 s. bark freely peeling.  
 Twigs roughened by lenticels and longitudinal  
 fissures; bundle traces 3; inner bark  
 reddish . . . . . Exochorda

Twigs not roughened as above.

Bundle traces 5; inner bark bright orange.

*Physocarpus*

Bundle traces 3; buds stalked; leaf scars narrow; pith spongy . . . . . *Ribes*

ss. Not freely peeling.

Twigs enlarged upwards through the season's growth; leaf scars scalloped and almost encircling the bud . . . . .

Twigs not enlarged upwards. . . . . *Dirca*

t. Buds red, elongated; twigs grayish.

Bud scales more or less twisted . . . *Amelanchier*

tt. Buds not red. . . . . *Aronia*

Bud scales keeled and mucronate . . . *Photinia*

(sometimes tinged red)

Bud scales not keeled nor mucronate.

Leaf scars essentially lacking; buds multiple; twigs fine and very dark.

*Tamarix*

Ordinary leaf scars present.

u. Bundle traces one.

Buds superposed.

Leaf scars much raised, with one or 3 bundle traces and with persistent stipules; fruit an inflated pod . . . . . *Colutea*

Leaf scars more or less raised, with 1 bundle trace and with minute stipule scars; fruit a persistent, berrylike drupe. *Ilex*

Buds solitary or occasionally collaterally multiple.

v. Bud scales two.

Scales ciliate; no stipule scars . . . *Nemopanthus*

Not ciliate, usually parted and exposing the hairy interior; stipule rather persistent, leaving narrow indistinct scars . . . *Cotoneaster*

vv. Bud scales more than two.

Buds globose to spindle-shaped (thickest at the middle) and with about 6 exposed scales.

*Spirea*

Buds ovoid and with fewer scales.

End-bud present, root deep red; bud scales indistinct,

glabrate, stipular; stipule scars small . . . *Ceanothus*

End-bud lacking or deciduous.

Seeds solitary in each fruit-cell; young branches with resinous dots . . *Gaylussacia*

Seeds several in each cell; young branches not resinous.

*Vaccinium*

uu. Bundle traces 3 or more.

Buds at first under a membrane, closely superposed in pairs, silky-hairy; scar finally U-shaped . . . . *Ptelea*

Buds never concealed by a membrane.

Twigs more or less 3-sided; buds rather large, usually stalked, and with 3 sub-valvate scales . . *Alnus*

Twigs and buds not as above.

w. Buds superposed.

Stipule scars relatively large;  
pith pale or light brown.

Stephenandra.

Stipule scars small; pith white.

Amorpha

ww. Buds solitary or collaterally  
multiple.

Leaf scars relatively large; buds  
with about 4 exposed scales.

Sorbaria

Leaf scars relatively small; buds  
with fewer or more scales.

x. Leaf scars 2-ranked.

Twigs slender; buds with  
2-3 exposed scales ..

Betula

Twigs moderate; buds with  
4-6 exposed scales ..

Corylus

xx. Leaf scars not 2-ranked.

Buds clustered near the tip  
and with numerous 5-ranked

scales; bundle traces

numerous . . . . . Quercus

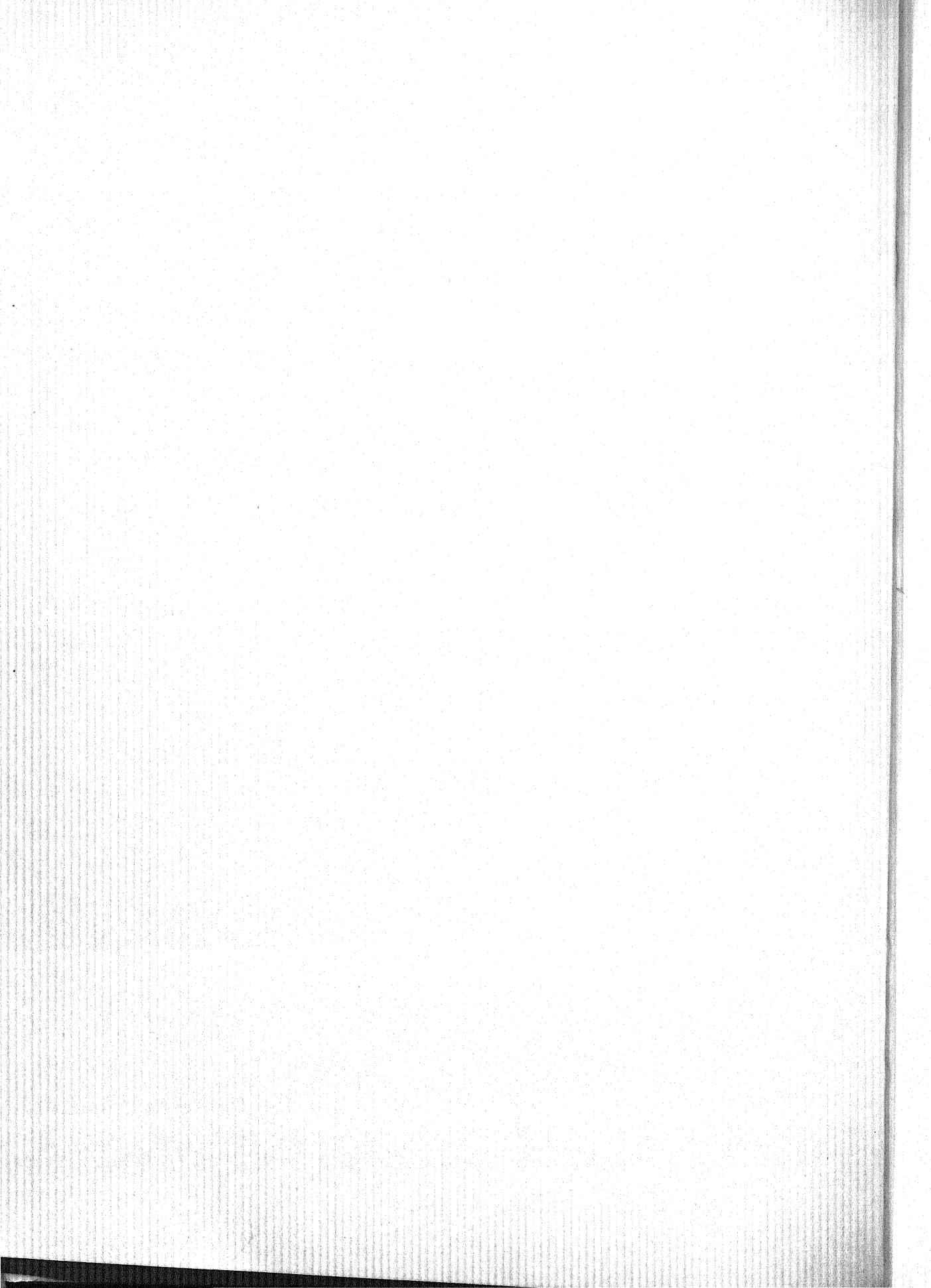
Buds not a above.

Bundle traces 3, minute

Prunus

Bundle traces 3, large

Xanthoceras



## KEY TO THE DECIDUOUS SHRUBS WHEN IN FOLIAGE

A. Leaves opposite or whorled  
 Branches and under side of leaves densely clothed with silvery or brown scales . . . . . Shepherdia  
 Not clothed with silvery or brown scales

B. Leaves compound  
 Leaves palmate  
 with 3 leaflets; flowers yellow, in drooping racemes; twigs green . . . . . Laburnum  
 with 5-7 leaflets; flowers in large, erect clusters; fruit a 3-valved pod . . . . . Aesculus

Leaves pinnate  
 with 3 leaflets  
 leaves all compound; flowers in racemes after the leaves . . . . . Staphylea  
 leaves chiefly simple; flowers yellow, not in racemes, before or with the leaves . . . . . Forsythia  
 with 5-9 leaflets; pith large . . . . . Sambucus

BB. Leaves simple  
 C. leaf margin entire, neither toothed nor lobed  
 leaves more or less punctate with pellucid dots; flowers bright yellow in summer; floral parts in 5's; fruit a dry, dehiscent capsule . . . . . Hypericum  
 leaves not punctate; flowers not yellow; fruit not dehiscent. twigs ending in a short spine between the upper-most buds . . . . . Rhamnus  
 twigs not spinescent

D. Petioles short  
 Nodes of stem flattened, parts aromatic when bruised . . . . . Calycanthus  
 Nodes not flattened, parts not aromatic  
 Leaves glabrous, glaucous below, often lobed on vigorous shoots; flowers small, pinkish bells . . . . . Symphoricarpos  
 not as above; leaves more or less hairy or glabrous, not glaucous nor lobed  
 Leaves firm and lustrous; branches greenish; fruit a drupe in panicles . . . . . Ligustrum  
 Leaves soft and dull, bluish or hairy; branches brown; fruit a berry in axillary pairs . . . . .

DD. Petioles medium or long  
 leaves with stipules, often 3 at a node; flowers and fruits in dense globular heads . . . . . Cephalanthus  
 Without stipules; flowers and fruits not in globular heads  
 Twigs squarish, especially at the nodes, gray; buds with stiff, keeled scales . . . . . Chionanthus  
 Twigs terete  
 Twigs slender and bright-colored; buds small or slender; terminal bud present; leaves with anastomosing veins, more or less pubescent . . . . . Cornus  
 Twigs less slender, tan-colored; end-buds usually lacking; leaves glabrous or glaucous or whitened beneath or finely dotted; flowers tubular in terminal pyramidal panicles . . . . . Syringa

CC. Leaf margin toothed or lobed  
 Twigs with 2-4 hairy, raised lines; fruit a 2-valved capsule . . . . . Weigela

Twigs not as above

Twigs yellowish or greenish, ridged, pithy, glabrous; leaves lanceolate to ovate, slightly fleshy . . . . . *Forsythia*

Twigs not as above

e. leaves distinctly lobed

Twigs densely brown tomentose near the tip . . . . . *Hydrangea*

Twigs not brown tomentose

Fruit a winged samara; leaves regularly palmately

lobed; buds with several overlapping scales . . . . . *Acer*

Fruit a drupe; buds naked or with two scales which meet but do not overlap . . . . . *Viburnum*

leaves very short-stalked; flowers and fruits in axillary cymes . . . . . *Callicarpa*

Leaf petioles short or moderate; flowers and fruits not in axillary cymes

f. twigs green, angled or ridged

Soft, pithy, half shrubs; flowers lavender in terminal clusters . . . . . *Buddleia*

Not as above; flowers in stalked, axillary clusters . . . . . *Euonymus*

ff. Twigs not green

Twigs ridged or winged . . . . . *Euonymus*

Twigs not ridged or winged

Twigs very hairy, gray . . . . . *Kolkwitzia*

Twigs not so hairy, brown

Leaf scars ciliate; flowers solitary; fruit a black drupe in terminal clusters of four . . . . . *Rhodotypos*

Not as above

g. all flowers fertile

Branchlets hollow; bark dark brown; peeling; flower clusters axillary; flowers with 5 petals; fruit indehiscent . . . . . *Deutzia*

With solid white pith; bark orange to orange-brown

Flowers and fruit sub-paniculate, terminal; flowers with 4 petals; fruit dehiscent in 4 valves; leaves 3-5 nerved at the base, remotely toothed; veins impressed . . . *Philadelphus*

Flowers of 2 kinds - fertile and sterile; leaves serrate

Leaves serrate; fruit a capsule; flowers & fruits in terminal corymbs . . . . . *Hydrangea*

Leaves dentate; fruit a drupe; flowers and fruits in cymes . . . *Viburnum*

## AA. Leaves alternate

Leaves minute and scale-like

Leaves not minute nor scale-like . . . . . *Tamarix*

h. Leaves compound

Leaves palmate

Leaves 5-parted, armed . . . . . *Acanthopanax*

Leaves 3-parted, not armed . . . . . *Ptelea*

Leaves pinnate

i. Plant aromatic when bruised without spines or prickles . . . . . *Rhus*

with spines or prickles young leaves glandular, sweetly fragrant and stipulate; prickles strong, hooked, mixed with

bristles . . . . . *Rosa*

All parts pungently aromatic; leaves pellucid-dotted; estipulate; prickles in pairs at the nodes . . . . . *Zanthoxylum*

ii. Not pungently aromatic

j. with thorns or prickles

branchlets very coarse and with a large pith, armed with very broad, stout prickles; leaves doubly compound, estipulate, prickly on the upper side *Aralia*

branchlets moderate; pith moderate or small; leaves singly compound and with stipules

Leaves without a terminal leaflet; leaflets obtuse at the tip; stipules often persisting as slender prickles . . . . . *Caragana*

Leaves with a terminal leaflet, acute at the tip

Prickles stipular, paired at the nodes . . . *Robinia*

Prickles numerous, not limited to the nodes.

Twigs angular, short-lived; leaves toothed and petioled; pistils borne on a convex receptacle . . . . . *Rubus*

Twigs terete, normal; leaves with dilated stipule-bearing petioles; pistils enclosed in an urn-shaped receptacle . . . *Rosa*

JJ. without thorns or prickles, leaflets more than three

Margin toothed

Flowers small in panicles; fruit a follicle . . *Sorbaria*

Flowers moderate in racemes; petals clawed; fruit a 3-valved capsule with thick walls . *Xanthoceras*

Margin entire

Bark fibrous or flaky; flowers in axillary racemes; fruits inflated, with papery walls; leaves not glandular . . . . . *Colutea*

Bark not fibrous nor flaky; flowers in terminal spikes; fruits tiny, glandular, bean-like pods; leaves punctured with glands . . . *Amorpha*

hh. leaves simple

k. leaves lobed

l. petioles with stipules

Leaves and buds 2-ranked; twigs slender, zigzag; flowers small, white . . . . . *Stephanandra*

Not 2-ranked; twigs coarse, bark peeling; flowers large, pink . . . . . *Rubus*

ll. Petioles without stipules

Bark freely peeling; leaf 3-lobed . . . *Physocarpus*

Bark firm

Twigs terminated with numerous, flat, round flower and fruit scars; habit erect; leaves wedge-shaped at base, lobing poorly defined, only the upper half toothed . . . . . *Hibiscus*

Twigs not so terminated with scars; habit arching or tangled

Leaves slightly 3-5 lobed, dark green above, pale beneath, not glandular . . . . . *Spirea*

Leaves distinctly palmately lobed, bright green both sides, glandular beneath . . . . . *Ribes*

kk. Leaves toothed but not lobed

m. Having thorns or prickles

Leaves clustered on short spurs . . . . . *Berberis*

Leaves not clustered on spurs

Thorns terminal . . . . . *Rhamnus*

Thorns lateral; leaves with large stipules, thick and glossy . . . . . *Cydonia*

mm. Without thorns or prickles.

n. Flowers and fruits in catkins.

Bark in papery layers with long transverse lenticels; fruit a minute nut with membranous wings . . . . . *Betula*

Bark not as above

buds covered by a single scale, twigs very flexible . . . . . *Salix*

buds with more than one scale, twigs less flexible.

Fruit a nut enclosed by a leafy involucre . *Corylus*

Fruit not in an involucre, but forming cones . . *Alnus*

nn. flowers and fruits not in catkins.

o. Plant aromatic when bruised.

Leaves very narrow and long, - pinnatifid, fernlike (See species for *Myrica*) . . . *Comptonia*

Leaves short, toothed near the tip or entire, fruits covered with a whitish resin . . *Myrica*

oo. Plant not especially aromatic.

p. twigs green, angular.

Leaves narrow-ovate, thin, sharply toothed, flowers yellow . . . . . *Kerria*

Leaves obovate, somewhat thick, palmate or 3-nerved; fruit with a conspicuous white pappus . . . . . *Baccharis*

pp. Twigs not typically green (or at least tinged red).

Leaves with resinous dots beneath . . *Gaylussacia*

Leaves not resinous-dotted.

Leaves typically with 3 main veins; root-stalk red, very large . . . . . *Ceanothus*

Leaves with only one main vein; root-stalk not red.

Petioles of leaves usually glandular . . *Prunus*

Not glandular

Leaves mucronate at the tip; margin obscurely serrate; fruit on long pedicels.

Not as above

Leaves glaucous, toothed near tip; fruit 5-lobed; bark reddish . . . . . *Nemopanthus*

Exochorda

Not as above

Fruit an acorn; leaves oblong, without stipules, obscurely toothed, gray-tomentulose beneath . . . . . *Quercus*

Not as above

q. Fruit a berry, drupe, or pome

r. Flowers in racemes

Racemes drooping, axillary; leaves oval to obovate

Amelanchier

rr. flowers not in racemes

Flowers solitary in the leaf axils; fruit a drupe; leaves singly serrate, with slightly impressed veins, pith green . . . . . *Ilex*

Flowers not solitary, in short corymbs or cymes.

Fruit hollow & open at top; a tall shrub or small tree . . . . . *Photinia*

Fruit closed & pointed at top.

Leaves with small black glands along the midrib

Aronia

Without such glands . . . . . *Rhamnus*

qq. Fruit a capsule or follicle.

Flowers in umbel-like racemes, corymbs or panicles, glabrous or pubescent; fruit of five follicles . . . . . *Spirea*

Flowers in terminal, slender, erect racemes or spikes, pubescence stellate, capsule splitting into 3 valves . . . . . *Clethra*

kkk. leaf margin entire

s. leaves and twigs clothed with silvery or brown scales.

Twigs with terminal thorns; leaves very slender;  
fruit bright orange; twigs with brown

scales near the tip . . . . . Hippophae  
Twigs with lateral spines or none; leaves less  
slender; fruit dry, yellow to pink; twigs with  
brown scales . . . . . Elaeagnus

ss. not clothed with silvery or brown scales

t. having thorns or prickles

Leaves in fascicles on short axillary spurs; habit  
shrubby; leaves rather small, oval and  
short-petioled . . . . . Berberis

Leaves often fascicled, slender, but not on spurs,  
and with long stipules; twigs yellowish; habit  
scrambling; leaves moderately small, lanceolate,  
cuneate, subsessile . . . . . Lycium

tt. without thorns or prickles

Twigs enlarged upwards through the season's  
growth; leaf petioles enclosing and concealing  
the bud . . . . . Dirca  
Twigs not thus enlarged; buds evident.

u. parts aromatic when bruised

Leaves large, oblong, bright green; twigs  
lustrous . . . . . Benzoin

Leaves moderate, oval, glaucous; twigs glaucous  
Cotinus (see Rhus)

uu. not especially aromatic

Leaves rather large, lop-sided, and with  
a sinuate margin . . . . . Hamamelis

Leaves symmetrical

v. buds enclosed by a single scale

Buds large, bearing a petiole-scar  
above the base; twigs encircled  
by a narrow scar at the nodes . . Magnolia

Buds small or moderate, appressed;  
petiole scar below the base of  
the bud; twigs very flexible, not  
encircled by a scar at the nodes . Salix

vv. buds with several scales

w. branchlets green, striped; leaves  
small, often ternate

Branches spineless; seeds with a callus  
appendage . . . . . Cytisus

Branches often spiny; seeds with-  
out callous appendage . . Genista

ww. Branchlets not green or at least tinged red  
Leaves with awl-shaped stipules, ovate  
to oval, lustrous dark green . . Cotoneaster

Leaves without such stipules.

Leaves resinous-dotted; fruit berry-  
like, with ten 1-seeded nutlets

Gaylussacia

Leaves not resinous-dotted.

Fruit a many-seeded berry . Vaccinium

Fruit a leathery or fleshy

1-seeded drupe; flowers before  
the leaves on old wood . . Daphne

A CANTHOPanax STEBOLDIANUS may be recognized thus

SUMMER : a shrub, sparingly branched and pri-

annual period, glabrous, acute, cuneate; flowers greenish-white, in terminal umbels;

leaf scar, often with short spurs or spur-like branchlets; leaf scars alternate on each lenticular, armed with 1-3 prickles beneath each

Leaves alternate, solitary, sessile, conical-ovoid, with about 3 thin scales evident; narrow,

The Genus *AMORPHA* may be distinguished thus

leaves alternate, pinnately compound, falling, awl-shaped, stiff,

the calyx usually gland-dotted; fruit a small pod, indehiscent, oblong, very glandular, curved on the back.

Summer Key

species	habit	leaflets	pubescence	calyx	flowers	fruit
<i>fruticosa</i>	tall shrub	lowest pair $\frac{1}{2}$ " or more from stem	sparse	lower lobes acute	purple	curved
<i>canescens</i>	low shrub	lowest pair close to stem	dense & whitish	lobes $\frac{1}{2}$ as long as tube	blue	—
Winter Key						
species	buds	twigs	stipule scars	leaflets	color	
<i>fruticosa</i>	superposed	glabrate	evident	moderate, scattered	blue-green	
<i>canescens</i>	solitary	white-woolly	minute	small, crowded	lead-gray	

ADAM'S GARDEN

3A is recognized thus  
branchlets very thick with stout cortical prickles; leaves alternate, very large, petiolate, pinnately to thrice pinnately compound, estipulate; leaflets distinctly stalked, with the veins curving before reaching the margin; base of the petiole clasping the stem to  $\frac{1}{2}$  or more; stones, less persistent than the red-violet pedicels; fruit small, black, a drupe with 2-5 flat-

## ACANTHOB ANAW

AMORPHIA — ABALTA

The Genus ARONIA may be distinguished thus

SUMMER : leaves elliptic or oblong to obovate, with minute black dots or glands along the midrib on the upper side; flowers white or marked pink, in small corymbs, with reddish anthers; fruit a small pome with persistent calyx lobes.

WINTER : twigs brown, glabrous, or pubescent, moderate, terete; leaf scars alternate, low, U-shaped, with 3 bundle traces and no stipule scars; buds solitary, sessile, appressed, usually red and elongated-oblong, with about 5 pointed and somewhat glandular-denticulate scales.

Summer Key

species	under side of leaves	branchlets	fruit
arbutifolia	pubescent	tomentose glabrous	red black
melanocarpa	glabrous or nearly so	glabrous	—

species	twigs and buds	under side of leaves	fruits
arbutifolia	hairy	rather woolly glabrous	red black
melanocarpa	glabrous or nearly so	glabrous	—

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BACCHARIS HALIMIFOLIA is recognized thus

SUMMER : an unarmed shrub; leaves alternate, moderate sized, simple, toothed but not lobed, petiolate, obovate, thickish, with 3 main veins from the base, cuneate, resinous; flowers and fruits in small heads, these in terminal panicles or corymbs; fruit an achene, ribbed and somewhat compressed, with a white pappus of long, bristly hairs.

WINTER : twigs green, angular or ridged, with a small, continuous pitch, resinous but not aromatic; leaf scars alternate, small, broadly v-shaped, slightly raised, decurrent in ridges from the angles, with 3 bundle traces and no stipule scars; buds small, oval or globose, with about 4 scales, encased in a hardened, greenish resin.

BENZOIN AESTIVALE is recognized thus

SUMMER : shrub with all parts aromatic; leaves alternate, simple, entire, oblong-obovate, with one main vein, acute, cuneate, glabrous, short-petiolated; buds evident, with 2-3 outer, pale-toned scales; flowers pale honey-yellow, fragrant, in subsessile, axillary clusters; fruit an oblong-obovate scarlet drupe.

WINTER : pale lenticels; leaf scars alternate, small, crescent shaped or half-round, slightly raised, with 3 bundle traces, often confluent, and no stipule scars; buds smallish, superposed, the upper flower buds collaterally doubled and stalked, the leaf buds with about three exposed scales; end-bud lacking.

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ARONIA -- BACCHARIS -- BENZOIN

**The Genus BERBERIS** is recognized in

**SUMMER** : leaves alternate, often fascicled on short axillary spurs, simple, often entire; inner bark and wood yellow; flowers yellow, axillary; fruit a several-seeded berry.

**WINTER** : shrubs with spines at the base of very short spurs; wood and inner bark or furrowed, slender; leaf scars half-round, with 3 minute, often indistinct bundle traces and no stipule scars.

traces

species	habit	flowers and branches	leaves	branchlets	spines
<i>buxifolia</i>	sub-evergreen	solitary	entire		present
<i>darwini</i>	"	racemes longer than leaves	dentate, green		"
<i>Mahoberberis neuberti</i>	"	unarmed, glabrous	not fascicled, often pinnately 3-foliolate	glabrous	unarmed
<i>Latifolia</i>	"	racemes shorter than leaves	dentate, glau-	pubescent,	
<i>mentorensis</i>	"	, glabrous	cous, blue-green	spiny	
<i>vulgaris</i>	deciduous	fascicled	not fascicled	glabrous	unarmed
			thicker than B. thunbergii		
<i>wilsonae</i>	"	racemes			
		fascicles, 2-6,			
<i>thunbergii</i>	"	short-stalked		puberulous	
		fascicles, 2-6,			
		slender stalked	red-green (varieties red)	glabrous	"
					simple

**N.B.** *B. sargentiana* and *B. Julianae* have glabrous branchlets and are evergreen.

**BUDDLEIA DAVIDI** may be recognized thus

**SUMMER** : semi-woody shrubs; leaves opposite, simple, short-petioled, serrate, glabrous above and white tomentose beneath; flowers violet or red-violet, tubular, with the stamens inserted above the middle of the tube, in long, slender panicles; fruit an oblong, pointed capsule.

**WINTER** : unarmed shrubs; twigs semi-woody, pithy; glabrous or puberulous, square, green to yellowish, bundle trace and with stipule scars transversely connected; buds oblong, sessile, sometimes superposed, with two outer scales.

*CALLICARPA AMERICANA* is recognized thus

SUMMER : leaves opposite, pubescent above, tomentose beneath, elliptic-ovate, acuminate, cuneate, crenate-serrate, with fairly long petioles; inflorescence subsessile; flowers small, in axillary cymes; fruit a small, violet drupe, subglobose, with 2-4 stones.

WINTER : a soft-wooded shrub; twigs dingy yellowish, round or slightly 4-angled, persistently scurfy with stellate hairs, slender, and with a comparatively large pith; leaf scars opposite or almost so, in 4 ranks, broadly crescent shaped, with one bundle trace and no stipule scars; buds small, often stalked, subglobose, superposed, bud-scales indistinct or almost valvate.

*CALYCANthus FLORIDUS* is recognized thus

SUMMER : aromatic shrubs; leaves opposite, short-petioled, entire, estipulate, ovate to elliptic, pinnately veined, densely pubescent beneath; flowers brownish-red or deep maroon red with numerous stamens and many narrow petals; fruit an indehiscent capsule, pear-shaped, rather large.

WINTER : shrub, sparingly branched; twigs moderate, villous, flattened at the nodes; leaf scars 2-ranked, opposite, the pairs often separated, horsehoe-shaped, much raised, with 3 bundle traces and no stipule scars; buds superposed, in a single bud-like aggregate, sessile, sometimes almost suppressed or hidden, brown-hairy, naked or appearing so; end-bnd lacking.

*CARAGANA ARBORESCENS* is recognized thus

SUMMER : an unarmed shrub without particular odor; leaves alternate, pinnately compound, without terminal leaflets; leaflets obtuse, soft hairy; stipules often persisting as slender, soft prickles; flowers fascicled, yellow, pea-like; fruit small, beanlike.

WINTER : branchlets moderate, stiff, greenish, with 3 decurrent ridges below each leaf scar; leaf scars alternate, much raised, very small, 2-round, with the rachis often persisting as a spine, having one bundle trace and stipules persistent, often pungent; buds small to moderate, solitary, sessile, with 3-4 exposed scales.

*COLUTEA ARBORESCENS* is recognized thus

SUMMER : branches unarmed, bark fibrous; leaves alternate, pinnately compound, odorless; leaflets small, entire, more than three, with small stipules; flowers yellow in axillary, long-peduncled, few-flowered racemes, pea-like, with the wings about as long as the keel; fruit a glabrescent, inflated pod, indehiscent, with papery walls.

WINTER : twigs moderate, grayish, terete but with decurrent lines from the nodes, appressed pubescent; leaf scars alternate, broadly crescent-shaped, much raised, with 1-3 bundle traces and with the stipules persistent on the sides of the leaf cushion; buds small, globose-ovoid, with 2-4 outer scales, superposed.

CALLICARPA -- CALYCANthus -- CARAGANA -- COLUTEA

*CEPHALANTHUS OCCIDENTALIS* is recognized thus

SUMMER : leaves opposite or whorled, simple, entire, with triangular stipules; petioles moderate; flowers white, small, in dense globular heads, axillary; fruit a small achene in dense globular heads, tan-colored.

WINTER : twigs terete, red-brown with light lenticels, dying back at the tips, glabrous; pith small, angular; leaf scars opposite or whorled (often 3 at a node), roundish, raised, with one bundle trace, and with evident stipule scars or the stipules persisting; buds small, often superposed, conical, indistinctly scaly, in depressed pockets; end-bud lacking.

*CEANOHTHUS AMERICANUS* is recognized thus

SUMMER : leaves alternate, simple, moderately large, odorless, ovate to oblong-ovate, acute or acuminate, irregularly serrate, with three main veins from the base, pubescent or acuminate beneath, with small stipules; flowers small, white, in terminal and axillary racemes or panicles; fruit a capsule, 3-lobed at the apex, finally splitting into 3 dehiscent parts, the cuplike receptacles persisting. WINTER : low shrub, unarmed; twigs terete, puberulent, rather slender, brown or greenish-brown; leaf scars alternate,  $\frac{1}{2}$ -round, slightly raised, small, with one transverse, evidently compound bundle trace, and with small stipules often persistent; buds solitary, sessile, small ovoid, pubescent, with few outer scales of which only the lower ones are distinct.

*CHIONANTHUS VIRGINICA* is recognized thus

SUMMER : leaves opposite, simple, entire, petiolate, oblong, estipulate; flowers white, in drooping panicles, from lateral buds, petals long and narrow; fruit a dark blue drupe, one-seeded. WINTER : Bark firm; twigs gray, squarish, especially at the nodes, pubescent while young; pith con-

tinuous and persistent; leaf scars opposite, relatively broad, crescent-shaped, raised, not large, with one transverse bundle trace and no stipule scars; buds superposed, sessile, pointed, keeled scales, ovoid, relatively small, with about six stiff, pointed, keeled scales.

*CHIONANTHUS ALNIFOLIA* is recognized thus

SUMMER : leaves alternate, toothed but not lobed, pinnately veined, serrate, glabrous, estipulate, subglobose capsule, splitting in 3 valves, persistent. WINTER : Bark firm; twigs brown, older twigs glaucous near tip, younger twigs scurfy tomentulose, then stellate-pubescent, obscurely triangular; leaf scars alternate, clustered near tip, triangular, low, with one bundle trace and no stipule scars; buds small, loosely scaled, sessile, ovoid.

*COMPTONIA PEREGRINA*\* is recognized thus

SUMMER : leaves alternate, simple, petiolate, linear-oblong, deeply pinnatifid, with round-ovate, oblique, mucronulate lobes, pubescent, pungent when bruised; flowers in catkins; fruit an ovoid nutlet, glabrous, subtended by elongated, awl-like bracts.

WINTER : an aromatic shrub; twigs terete or angular, slender, resinous-dotted while young; pith small, green; leaf scars alternate,  $\frac{1}{2}$ -elliptical or triangular, more or less raised, with 3 bundle traces and small stipule scars; buds small, solitary, subglobose, sessile, with 2-4 outer scales; end-bud lacking.

*COMPTONIA* (syn. *Myrica*)

The Genus *CORNUS* is recognized thus

SUMMER : erect, deciduous, unarmed shrubs; twigs reddish or greenish; leaves opposite except in one species, viz. *alternifolia*, petiolated, entire, with anastomosing veins; flowers in terminal cymes or heads, small, often surrounded by involucral bracts; fruit a small drupe.

species	arrange- ment	under side of leaves	pith	fruit	involucre	flowers	floral pubes- cence	leaves	lateral buds	habit	twig color
<i>alterni- folia</i>	alter- nate	hairs irreg- ularly diverging						cuneate			
<i>amomum</i>	opposite	light green, veins rusty- pubescent	brown	blue, spher- ical			woolly, spreading	only the veins pubes- cent			red- violet
<i>sanguinea</i>	"	light gr., villous	white	black			"				green- ish
<i>mas</i>	"	"	"	"	reddish-deciduous	dense	yellow	not woolly, gla- brous	very di- vergent		
<i>florida</i>	"	whitened beneath	"	"	reddish, pedicel short	umbels, with involu- cre	yellow	not woolly, gla- brous			
<i>kousa</i>	"	"	"	"	showy, with emargin- ate bracts	in flow- er-like heads	white	"			
<i>Baileyi</i>	"	"	"	"	white spher- ical	lacking	cymose	woolly	stalked	sessile	brown- ish-red
<i>stolon- ifera</i>	"	"	"	"			spreading	ovate- subap- pressed		sessile	red
<i>alba</i>	"	"	"	"	ellipti- cal, stone- com- pressed	cymes flat	"	acuminate, broad	long- stalked	long- stalked	bright red
<i>racemosa</i>	"	"	"	white or brownish	white with red stone pedicels not com- pressed	cyme pani- culate, convex	"	acute, whitish beneath	erect	erect	grayish

The Genus **CORNUS** is recognized in

WINTER : erect, deciduous, unarmed shrubs with red or green branches; leaf scars opposite, rarely alternate, meeting around the twig, small, narrow, in four ranks, with 3 bundle traces; pith continuous and persistent; winter buds elongated, with 2 valvate scales, axillary buds appressed.

species	arrange- ment	fruit color	twig color	fruits	flower buds	leaf scars	habit	buds and branch- twigs	lateral buds	pith
alterni- folia	alter- nate	bluish, bloomy red	green	united into enlarged, a globose fleshy head vertically	raised cover- ing buds	stratified	glab- rous	con- cealed		
Kousa	opposite			flattened			soon			
florida	"	"	"	enlarged, but in dense clusters	"	"	"			
mas	"	"	"	"	"	not as erect, less strati- fied				
racemosa	"	white, on red pedicels	grayish	in loose cymes	not en- larged	"	erect, twiggly	silky- hairy	sub- erect	
amomum	"	blue	purple- red	"	"	"	ascending spreading	pubes- cent	sub- erect or nearly nearly	brown ish
sanguinea	"	black	green with up- per side deep red	"	"	"	"	sessile	white	
baileyi	"	bluish- white	red	"	"	"	hairy all over	"	or al- most so	"
alba	"	"	"	"	"	"	loose and osierlike	hairy, twigs scarcely glabrous	stalked	"
stoloni- fera	"	"	"	"	"	"	more erect, loose and osierlike	glabres- cent	long- stalked	"
							"	"	not stalked	"

The Genus *CORYLUS* is recognized thus

**SUMMER** : twigs moderate, zigzag, pubescent; flowers in catkins; fruit an ovoid nut in a thin, fringed or toothed involucrue. **WINTER** : an erect shrub with moderate, zigzag, pubescent twigs; buds alternate, solitary, sessile, greenish in color with brown edges; end-bud lacking; leaf scars 2-ranked, half-round or triangular, a little raised, with 3 bundle traces and long stipule scars; flower-buds in catkins.

**Summer Key**

species	branchlets	involucrue	involucral bracts	leaves
avellana	glandular-pubescent	of two bracts	not or only slightly longer than the nut	suborbicular to broad-ovate, often slightly lobulate
americana	"	"	about twice as long as the nut, closed	broad-ovate or oval
cornuta	slightly hairy	tubular	"	ovate to obovate

**Winter Key**

species	buds	fruit
avellana	small, glabrescent	husk open, hardly longer than the nut
americana	small, gray-pubescent; outer scales persistent	husk closed or longer than the nut, frilled
cornuta	gray-pubescent, outer scales elongated, quickly falling	husk closed or longer than the nut, beaked or tubular

The Genus COTONEASTER is recognized in

SUMMER : erect or sprawling shrubs; leaves simple, usually smallish, entire, short-petioled, alternate, with awl-like stipules; flowers white or pinkish, small and not conspicuous, terminal on short lateral branchlets; fruit a small drupe-like pome or pome-like drupe with persistent, incurving sepals, and 2-5 stones.

WINTER : twigs slender, rounded; leaf-scars alternate, minute, elliptical, raised, with one indistinct bundle trace and persistent stipules; buds solitary, sessile, ovoid or oblong, with the outer scales parted and showing the hairy bud inside.

species	character	habit	leaves	under side of leaves	upper side of leaves	inflorescence	branches and twigs	flowers	size of buds	size of leaves	fruit
<i>microphylla</i>	evergreen or sub-evergreen	obovate	densely hairy	sparingly round-oval	lustrous			petals spreading			red
<i>horizon-talis</i>	"			pubescent				horizontal with up-lying spread-right petals			red
<i>rotundifolia</i>	"		"	hairy when young, soon glabrous	dull			"	"		"
<i>dammeri</i>	"	elliptic	"	lustrous				trailing with spreading petals			"
<i>adpressa</i>	deciduous	prostrate	margin wavy							one inch or less	"
<i>zabelii</i>	"	erect	apex obtuse	yellow tomentose							"
<i>dielsiana</i>	"	"	mostly acute	mostly obtuse							"
<i>hupehensis</i>	"	"	apex obtuse or acutish	thinly tomentose				many-flowered corymbs		calyx villous	"
<i>divaricata</i>	"	"	obtuse	glabrous or slightly pubescent on the midrib				few-flowered cymes		"	"
<i>racemiflora</i>	"	"	sub-orbicular, obtuse	white, tomentose				many-flowered corymbs	gray	calyx tomentose	"
<i>interrigma</i>	"	"	obtuse	whitish or grayish					or more	calyx tomentose	"
<i>acuminata</i>	"	"	acute	tomentose						large	"
<i>foveolata</i>	"	"	mostly acute	glabrescent						small to	red, not glaucous
<i>acutifolia</i>	"	"	mostly acute	mostly pubescent chiefly on the veins						glabrate	black
				glabrescent						medium to	large or persistently hairy
				acute						"	smaller persistently hairy

COTONEASTER -- Summer Key

For winter identification of the Genus COTONEASTER see preceding page

species	habit	fruit	branchlets	buds	twig color	pubescence	fruit	fruit position	sepals
<i>Scutellaria</i>	spreading bushy	black	moderate	smallish, persistently hairy	red-brown to very dark	twigs hairy			
<i>foveolata</i>	spreading	"	"	large, sub-glabrescent	gray-brown to straw color	"			
<i>racemiflora</i>	spreading and ascending	glaucous red	moderate, rigid	small, silky, at first, finally glabrescent	yellowish	finnally glabrate			
<i>hupenhensis</i>	arching and drooping	red, not glaucous	very slender	small, glabrate					
<i>dielsiana</i>	erect arching	red, small, hairy at apex	purple to red-brown	smallish to larger and persistently hairy	"	densely gray-woolly	on lateral spurs, not nodding		
<i>divaricata</i>	spreading	red, oblong	moderate, slender	small, persistently hairy	rusty-brown	glabrescent at least later			
<i>zabelii</i>	"	"	"	small, persistently hairy	rusty-brownish to densely pubescent	branchlets			
<i>interregnum</i>	erect bushy	red, large, glaucous	moderate	large, glabrescent or persistently hairy	very dark	glauous red	nodding, axillary, large		
<i>acuminata</i>	"	"	moderate, dull dirty pubescent near apex	large, glabrate pointed	"	"	pubescent near apex		
<i>adpressa</i>	prostrate with creeping stems	red	strigose-pubescent, irregularly distichous	strigose					
<i>horizontalis</i>	sub-evergreen	red	irregularly branched						

**CYDONIA JAPONICA** (*Chaenomeles lagenaria*) is recognized thus

**SUMMER** : leaves alternate, simple, toothed but not lobed, short-petioled, ovate to oblong, serrate, lustrous and glabrous, with often leaf-like stipules; branches often with terminal and lateral thorns; flowers red, varying from white to pink to deep red and orange; fruit a fairly large yellow pome.

**WINTER** : a much-branched shrub, with or without thorns; twigs moderate, terete, glabrous, orange or reddish, rigid, with or without terminal and axillary twig spines; leaf scars alternate, small, linear or crescent-shaped or narrowly triangular, raised, with 3 minute bundle traces and with rather long stipule scars; buds sessile, small, solitary becoming multiple, round-ovoid, with few outer scales; end-bud lacking.

**CYTISUS SCOPARIUS** is recognized thus

**SUMMER** : a small to moderate sized shrub with green stems; leaves alternate, simple or more usually 3-parted, sometimes minute or lacking, and with minute or absent stipules; leaflets obovate or oblanceolate with few appressed hairs while young, entire; flowers yellow, usually solitary, axillary, the style longer than the keel; fruit a flat, linear-oblong, dehiscent pod with villous margins, the seeds with a thickened and hardened appendage.

**WINTER** : unarmed and odorless; branchlets bright green, prominently ridged or angled, even almost winged; leaf scars alternate, very small, raised, with one indistinct bundle trace and minute stipule scars; buds small, solitary, sessile, round-ovoid, with about four often indistinct scales.

**The Genus DEUTZIA is recognized thus**

**SUMMER** : erect shrubs with peeling bark; leaves opposite, short-petioled, serrate, without stipules; flowers in panicles or cymes, usually terminal on lateral branchlets, white or pinkish; fruit a 3-5-valved capsule, indehiscent.

**WINTER** : erect shrubs with brown, peeling bark; branches usually hollow; twigs terete, usually dying back at the tip; pith moderate, round, pale and spongy or brown and excavated; leaf scars opposite, 4-ranked, linear or triangular, with 3 bundle traces and no stipule scars; buds ovoid, nearly sessile, with several pairs of outer scales.

**Summer Key**

species	habit	pith	petals	inflorescence	under side of leaves
scabra	to 6'	brown, excavated	erect, oblong	broad, loose panicle	rough pubescent
rosea	to 3'	white	"	"	
gracilis	to 3'	"	erect, white, oblong	elongated panicle or raceme	glabrous
lemoinei	to 4'	"	spreading, white, broadly ovate	corymbs or cymes	glabrous
parviflora	to 6'	"	spreading, white, roundish-obovate	"	nearly glabrous

**Winter Key**

species	pith	buds	bud scales	bud size	leaf scars
scabra	brown, excavated	"	"	"	
parviflora	white	ovoid, canescent	acute	"	
lemoinei	"	glabrate, brownish	attenuate	"	
rosea	"	glabrate, brownish	ovoid	"	longer than lowest scale
gracilis	"	glabrate, brownish	"	"	not so

**DIRCA PALUSTRIS** is recognized thus

**SUMMER** : an unarmed shrub with the branchlets enlarged upwards; leaves alternate, simple, entire, short-petioled, obovate, obtuse, cuneate, glaucous beneath; leaf petioles enclosing and concealing the buds; flowers before the leaves, apetalous, short-stalked, pale yellow, in axillary clusters of 2-3 on old wood; fruit a pale green or reddish drupe, ellipsoid.

**WINTER** : a shrub with soft wood and very, very tough bark, unarmed, odorless; twigs flexible, enlarged upwards, glabrous, brownish with white lenticels, terete; leaf scars alternate, scalloped, almost encircling the bud, 2-ranked, elevated at the swollen nodes, with 5 bundle traces and no stipule scars; buds small, short-conical, solitary, sessile, with about 4 indistinct dark silvery scales; end-bud lacking.

The **ELAEAGNACEAE** MAY be recognized both summer and winter by the silvery or brown scales which clothe the twigs and branches and leaves and buds.

Genus	species	arrangement	foliage	thorns	twigs	winter buds	fruit	leaf margin	leaves	flowers & fruits
<i>Shepherdia</i>	<i>rotundifolia</i>	opposite	evergreen							
	<i>argentea</i>	"	deciduous	present	silvery					
	<i>canadensis</i>	"	"	without	brown					
					silvery					
<i>Hippophae</i>	<i>rhamnoides</i>	alternate	"	terminal	gray-silvery, brown	scurfy	bright orange, poison-ous	very slender		
					end in spines					
<i>Elaeagnus</i>	<i>angustifolia</i>	"	"	lateral	with silvery scales, none brown	no brown scales	dry, yellow, persist.	entire, crisped	silvery both sides	
	<i>argentea</i>	"	"	without	with brown scales	with some brown scales	dry, silvery, soon gone	more or less silvery	pendent	
	<i>multiflora</i>	"	"	"	"	with some scales, end-bud conical-ovoid	red, juicy, soon gone	silvery beneath		
	<i>umbellata</i>	"	"	"	silvery, with few brown scales	dark, red-brown, sub-globose	red, juicy, persis-ting	much silvery, crisped	erect	
						with few brown scales	small, ap-pressed, end-bud elong-ated	silvery beneath		

sequence of bloom and fruiting

argentea - flowers in June fruits in August ff.  
 angustifolia " May, June " July, August  
 multiflora " April, May " June, July  
 umbellata " May, June " September

ELAEAGNACEAE

DIRCA --

The Genus EUONYMUS is recognized thus

SUMMER : deciduous or evergreen shrubs, sometimes creeping or climbing by rootlets; twigs moderate, rounded or 4-lined from the nodes or 4-angled or 4-winged, characteristically green; pith angulated or rounded, spongy or incompletely excavated; leaves opposite or nearly so, peltioid, glabrous; flowers in axillary cymes, floral parts in 4's or 5's; fruit a 4-5 celled, lobed capsule (occasionally 2-3 celled); capsule pink or pinkish, orange within, and with black seeds.

species	foliage	habit	leaves	branchlet color	twigs	fruit	buds	capsule color
radicans	evergreen	trailing	broadly oval					
japonica	"	erect	dull above elliptic to oblong, bright green					
obovata	deciduous	low, prostrate	ovovate					
yedoensis	"	erect	obovate, large and coarse	orange				
alata	"	"	not as above	greenish winged			ovoid, scales with long points	
americana	"	"	"	green	not winged, square	tuberulate	slender pointed divergent	deep rose-red
europea	"	"	"	"	terete, often 4-lined	smooth		
bungeana	"	"	"	"			less slender, obtuse buds	deep rose-pink
atropurpurea	"	"	"	purple	"	"	elongated, appressed oblong, with loose, oblong scales	very pale yellow- ish or pinkish violet-red

The Genus EUONYMUS is recognized thus

WINTER : shrubs with moderate twigs, rounded or 4-lined or 4-angled, or 4-winged, characteristically green; pith angled or rounded, spongy or incompletely excavated; leaf scars opposite or nearly so, half-elliptical, rather small, slightly elevated, with one bundle trace and minute, indistinct stipule scars; buds with imbricate scales, solitary, sessile, with 2-5 pairs of serrulate scales.

species	foliage	habit	twigs	fruit	bud scales	buds	twig color
obovata	deciduous	low, <u>prostrate</u>					
alata	"	<u>erect</u>	corky winged not winged				
americana	"	"	square				
europea	"	"	terete, often 4-lined	smooth, 4-lobed	pressed dry- margined	upcurved ovoid, obtuse	green
yedoensis	"	"	"	lobes obtuse			
bungeanus	"	"	"	large, pale pink	long- pointed	ovoid	twigs green, branches orange
atropurpureus	"	"	"	very pale pinkish- yellow	slightly elongated		green
japonica	evergreen	"	"	violet-rose	loose, oblong		purple
radicans	"	trailing or climbing	"				

EUONYMUS -- Summer Key

EXOCHORDA GRANDIFLORA is recognized thus

SUMMER : a large shrub; leaves alternate, simple, oblong, cuneate, toothed near the tip, glabrous, glaucous beneath, with one main vein; flowers white with green centers, in loose, terminal racemes; fruit a 5-lobed capsule, persistent, separating into 5 bony sections, finally dehiscent; seeds winged unarmed and odorless; bark reddish, freely peeling, inner bark orange, branches gray-brown; twigs slender, glabrous, terete, roughened with lenticels and longitudinal fissures; leaf scars alternate, narrow, shallowly V-shaped or linear, raised, with 3 bundle traces and no stipule scars; buds moderate, solitary, sessile, ovoid with pointed and fringed scales.

WINTER :

EUONYMUS -- Winter Key -- EXOCHORDA

The Genus *FORSYTHIA* is recognized thus

**SUMMER** : loose shrubs with yellowish twigs and very bright green foliage; leaves opposite, petiolate, glabrous, occasionally 3-parted, usually serrate; flowers very early, yellow, bell-shaped, axillary, with four oblong lobes; fruit a 2-celled, dehiscent capsule.

**WINTER** : loosely branched or scrambling shrubs with yellowish twigs and opposite arrangement; twigs somewhat angled, buds moderate and multiple, sessile, with about six pairs of scales; leaf-scars opposite, shield-shaped, rather small, raised, with one bundle trace and no stipule scars.

Summer and Winter Keys combined

species	habit	twig color	pith	flowers	leaves
<i>viridissima</i>	erect, stiff	a little greenish	chambered or all excavated (through nodes and internodes)	with pistil long	long, narrow, plain outline
<i>intermedia</i>	arching	yellowish	solid at nodes, internodes chambered	with pistil short	partly lobed
<i>suspensa</i>	pendulous	yellowish	nodes solid, internodes excavated	"	or divided on broad shoots

N.B. *F. suspensa* var. *fortunei* is rather erect in growth.

*GAYLUSSACIA* BACCATA is recognized thus

**SUMMER** : deciduous; leaves alternate, short-petiolated, entire, with resin-glands above and below; flowers in dense but short racemes, axillary; fruit a berrylike drupe with 10 one-seeded nutlets, calyx persistent; seeds solitary in each fruit cell.

**WINTER** : twigs slender, terete, with a small pitch, young growth resinous-dotted; leaf scars alternate, sessile, ovoid, with 2-5 outer scales; end-bud lacking.

*GENISTA TINCTORIA* is recognized thus

**SUMMER** : unarmed; leaves alternate, simple, glabrous beneath, ciliate, elliptic-oblong to oblong-lanceolate, entire, usually with small stipules; flowers yellow, in many-flowered, terminal racemes; fruit a linear-oblong pod, compressed but not flat, glabrous or glabrescent.

**WINTER** : upright or ascending, with the slender, bright green twigs not much branched; twigs ribbed or grooved, terete, glabrous; leaf scars alternate, with one bundle trace and the stipules more or less persistent.

The Genus *HAMAMELIS* is recognized thus

SUMMER : erect shrubs with yellowish pubescent branchlets; leaves alternate, short-petioled, lopsided, sinuate-dentate, with large stipules which fall off early; flowers yellow, with strap-shaped petals, in short-peduncled, axillary, few-flowered clusters, occurring in autumn; fruit a tomentose, 2-valved capsule.

WINTER : twigs yellowish-pubescent or tomentose at first; leaf scars alternate, 2-ranked, half-round or 3-lobed, slightly raised, with 3 bundle traces and unequal stipule scars, one round and one elongated; buds naked, oblong, stalked, tomentulose.

Summer and Winter Keys combined

species	leaves	buds	flowers	fruit	calyx
<i>virginiana</i>	obovate or elliptic	short (5-8 mm.)	in late autumn surrounded to 1/2 by the calyx	brownish-yellow inside	
<i>vernalis</i>	obovate, glaucous beneath	short (5-8 mm.)	in late winter surrounded to 1/2 by the calyx	dark red inside	
<i>japonica</i>	broad-ovate, green beneath	long (10 mm.)	in late winter surrounded at base only by calyx	red or purple inside	

*HIBISCUS SYRIACUS* is recognized thus

SUMMER : leaves alternate, simple, 3-lobed, ovate or rhombic-ovate, coarsely toothed above the middle, cuneate, short-petioled, palmately veined, glabrous, estipulate; flowers rather large and conspicuously, solitary, axillary; fruit a capsule, dehiscent into 5 valves; seeds flattened, with a ring of gray hairs about the margin.

WINTER : bark gray, firm; twigs terete, but fluted near the dilated tip and terminated by relatively large, roundish flower and fruit scars; pith white, green margined; leaf scars alternate, crowded near the ends of twigs,  $\frac{1}{2}$ -round or transversely elliptical, raised, with ridges extending below, and with 4 compound and irregular, often indeterminate, bundle traces, stipule scars small, elliptical.

**The Genus HYDRANGEA is recognized thus**

**SUMMER** : erect or climbing shrubs with peeling bark; leaves opposite or whorled, petiolate, usually serrate, rarely lobed, without stipules; flowers in terminal corymbs or panicles, often with sterile marginal flowers; fruit a 2-5 celled capsule opening at the apex.

**WINTER** : soft-wooded shrubs or root-climbers; deciduous; twigs rounded, with a large, continuous, pale pith; leaf scars opposite or whorled, crescent-shaped, frequently three at a node or connected by a line around the twig, with 3 bundle traces and no stipule scars; buds moderate, solitary, sessile or very short-stalked, globose-conical to oblong, with 2-3 pairs outer scales.

**Summer Key**

species	habit	twigs	leaves	flowers and fruits
<i>petiolaris</i>	climbing			
<i>quercifolia</i>	shrubby		tomentose, orange-red lobed	
<i>paniculata</i>	shrubby		glabrate	paniculate
<i>arborescens</i>	shrubby	glabrate	not lobed	flat-topped cymes

**Winter Key**

species		bark	buds
<i>petiolaris</i>	climbing		
<i>quercifolia</i>	shrubby	tomentose, orange-brown flaking	
<i>paniculata</i>	shrubby	brown, firm	round, conical, horizontal
<i>arborescens</i>	shrubby	yellow, firm	spreading, oblong

The Genus HYPERICUM is recognized thus

**SUMMER** : leaves opposite, short-petioled or sessile, entire, dotted with transparent glands, without stipules; flowers yellow, in terminal or axillary cymes, with numerous stamens; fruit a capsule dehiscent along the partitions.

**WINTER** : small shrubs with peeling bark; twigs slender, angled below the nodes; pith small, green or brown, spongy and finally excavated; leaf scars opposite, sometimes whorled, rhomboid or lens-shaped, scarcely raised, with one bundle trace and no stipule scars; buds solitary, sessile, minute, with several scales.

Summer Key

species	stems	flowers	flower clusters	number of styles	leaves	cymes
<i>moserianum</i>	terete or 2-edged	in 1-3 flowered clusters		five	narrow ovate	
<i>calycinum</i>	4-angled	solitary		"	"	
<i>lobocarpum</i>	"	in cymes	many-flowered	"	linear-oblong to lanceolate	
<i>kalmianum</i>	"	"	few-flowered	"	linear-oblong	
<i>densiflorum</i>	"	"	" terminal	three	"	forming a terminal corymb
<i>prolificum</i>	2-angled	"	axillary	"	narrow-oblong or oblanceolate	axillary

Winter Key

species	stems	angles of stem	buds	habit	inflorescence	capsule	furrows of capsule
<i>moserianum</i>	terete			sub-shrub			
<i>prolificum</i>	winged or angled	two, not persistent		2 <sup>1</sup> high			
<i>calycinum</i>	"	angled	four, persistent	stout, dense shrub			
<i>kalmianum</i>	"	"	scaly	low, small shrub, stoloniferous			
<i>lobocarpum</i>	"	"	scarcely with specialized scales	openly bushy, branches contorted	few-flowered cymes	ovoid	5-angled
<i>densiflorum</i>	"	"	"	upright, bushy	many-flowered cymes	oblong	"

**ILEX VERTICILLATA** is recognized thus

**SUMMER** : leaves alternate, of moderate size, simple, narrow elliptic or obovate, serrate, acute, cuneate, with impressed veins, estipulate; flowers solitary, axillary, small, whitish, short-stalked; fruit a bright red, globose drupe, holly-like, persistent.  
**WINTER** : an odorless and thornless shrub with smooth dark gray bark; twigs smooth gray, sometimes streaked lighter gray on the upper side; pith green; leaf scars more or less raised, with one bundle trace and minute stipule scars; buds smooth gray streaked light gray, firm and hard, with 2-4 imbricate scales, sessile, superposed.

**KOLKWITZIA AMABILIS** is recognized thus

**SUMMER** : leaves opposite, simple, broad-ovate, short-petioled, acuminate, base rounded, margin shallows-toothed or entire, ciliate, hairy beneath; flowers pink with a yellow throat, puberulous, paired forming terminal corymbs on short lateral twigs; fruit a capsule, ovoid, grayish, very bristly-hairy.  
**WINTER** : a shrub with freely peeling, gray-brown bark; twigs gray; leaf scars opposite, crescent-shaped or triangular, raised, connected by a line around the twig, with 3 bundle traces often confluent, and no stipule scars; buds gray-velvety, sessile, solitary, ovoid, with 3-4 pairs of scales.

**KERRIA JAPONICA** is recognized thus

**SUMMER** : leaves alternate, simple, oblong-ovate, acuminate, doubly serrate; flowers yellow, solitary, perfect, with numerous stamens; fruit a dark brown achene.  
**WINTER** : an unarmed, odorless shrub; twigs bright green, slender, zigzag, 5-angled or ridged, glabrous, pith relatively large, white, continuous; leaf scars alternate, small, 2-ranked, crescent-shaped or triangular, slightly raised, with 3 bundle traces and no stipule scars; buds small, solitary, sessile, oblong, with about 5 outer scales, sub-appressed.

The Genus LIGUSTRUM is recognized thus  
 SUMMER : leaves opposite, simple, entire, short-petioled; flowers white, smallish, in terminal panicles; corolla lillac-like; fruit a 1-4 seeded berry-like drupe, black or bluish-black.

Summer Key

species	leaf scar	fruit color	branches	leaves	leaf tip	lenticels	habit	fruit
ovalifolium	broad as bud	—	glabrous	—	—	—	—	—
vulgare	narrow	black, glossy	—	“	—	—	—	—
acuminatum	“	“	pubescent	pubescent above near the margin	acute	—	—	—
amurensis	“	dull blue-black	“	glabrous above	obtuse	prominent	—	—
ibota	“	“	“	“	“	—	tall, arching	nodding, pedicelled
ibota regelianum	“	“	“	“	“	“	low, spreading horizontally	“
quihoui	“	“	puberulent	“	“	—	—	sessile

The Genus **LIGUSTRUM** is recognized thus

**WINTER** : deciduous but holding the leaves very late; twigs slender, round; pith moderate, white; leaf scars opposite or almost so, small, crescent-shaped or elliptical, raised, with one bundle trace and no stipule scars; buds small, sessile, ovoid, with 2-3 pairs of outer scales, occasionally superposed.

#### Winter Key

species	leaf scar	branches	fruit color	lenticels	habit	fruit
<i>ovalifolium</i>	broad as bud	Glabrous				
<i>vulgare</i>	narrow	"	black, glossy			
<i>acuminatum</i>	"	pubescent	"			terminal in line of branch
<i>amurense</i>	"	"	dull, blue-black	prominent		
<i>ibota</i>	"	"	"			
<i>ibota regelianum</i>	"	"	"		low, spreading horizontal	nodding, pedicelled
<i>quihoui</i>	"	puberulent	"	"	"	sessile

**LINDERA BENZOIN** -- see *Benzoin aestivale*

**LIGUSTRUM** -- **Winter Key - LINDERA**

The Genus *LONICERA* is recognized thus  
SUMMER : leaves opposite, usually short-petioled or sessile, entire, without stipules; flowers in  
axillary, peduncled pairs, each with 2 bracts and 4 bractlets; corolla tubular; fruit a berry.

species	habit	flowers and fruits	pith color	floral pith	upper lip leaves of corolla	leaf tip	winter buds	bractlets	peduncles
sempervirens	climbing	terminal interrupted spikes		red, trumpet-shaped	glabrous, glaucous				
		axillary pairs		yellow, interior		pubescent			
				white to yellow					
<i>japonica</i>	"	"	"	"	"	"	"	"	"
<i>halliana</i>	shrubby spreading tangled	ascending	white	white	"	"	"	"	"
<i>fragrantissima</i>	"	"	"	"	"	"	"	"	"
<i>standishi</i>	shrubby ascending	"	"	"	"	"	"	"	"
<i>korolkowii</i>	"	"	"	"	"	"	"	"	"
<i>tatarica</i>	"	"	"	"	"	"	"	"	"
<i>bella</i>	"	"	"	"	"	"	"	"	"
<i>notha</i>	"	"	"	"	"	"	"	"	"
<i>muendeniensis</i>	"	"	"	"	"	"	"	"	"
<i>xylostemon</i>	"	"	"	"	white or pale yellow	"	"	"	"
<i>chrysanththa</i>	shrubby spreading	"	"	"	"	"	"	"	"
<i>morrowi</i>	"	"	"	"	"	"	"	"	"
<i>ruprechtiana</i>	ascending	"	"	"	"	"	"	"	"
<i>maackii</i>	erect, large shrub	"	"	"	"	"	"	"	"

The Genus *LONICERA* is recognized thus

WINTER : twigs round, slender; leaf scars opposite, crescent-shaped, small, on the tips of the raised bases, with 3 bundle traces and often no stipule scars; buds often superposed, sessile, widely divergent, with numerous 4-ranked scales.

species	pith	buds	twigs	bud size and position	bud scales	habit	bud tip	bud growth	lateral buds	twigs hairy
<i>fragrantissima</i>	white		glabrous							
<i>standishii</i>	"		bristly hairy							
<i>Xylostemon chrysanththa</i>	brown	elongated excavated	very hairy	terminal about equal lateral	gray with long ciliate hairs					
<i>maackii</i>	"	"	a little hairy	terminal mostly lateral	"					
<i>tatarica</i>	"	"	very scurfy	larger than lateral	clustered in twig axils	glabrous, brown				
<i>bella</i>	"	not elongated	glabrous	slender-ovate pointed	short, globose	oval, obtusish				
<i>ruprechtiana</i>	"	"	"	pubescent	erect	acute				
<i>morrowi</i>	"	"	glabrescent or pubescent		spread-obtusely	terminal	very divergent, almost right angled			
<i>notha</i>			"		lateral	opposite	less divergent, almost right angled to			
<i>muendenensis</i>	"	"	"		lateral	about equal to	less divergent about 60°			
<i>semperflorens</i>					terminal	scarce	terminal or scarcely developed			
<i>japonica</i>										
<i>halliana</i>										

The Genus *LYCUM* is recognized thus  
 SUMMER : leaves alternate, often fascicled, short-petioled, entire; flowers axillary, solitary or  
 clustered, slender-petioled; fruit a red oblong berry.

Summer Key

species	habit	twigs	leaves	fruit	foliage color	corolla tube
chinense	scrambling, wide spreading, loosely branched	buff-gray	rhombic-ovate to ovate-lanceolate	oblong	bright green	shorter than the limb, rather wide
halimifolium	erect, spreading bushy, with moderate shoots	pale, in axils	oblong-lanceolate not hairy	oval	gray-green	longer than the limb, narrowed below the middle

WINTER : scrambling shrubs with slender spinescent twigs; twigs 5-angled, glabrous, often whitish or short striate; leaf scars alternate, crescent-shaped, small, raised, with one bundle trace and no stipule scars; buds small and inconspicuously multiple or dwarf aggregates with few outer scales.

Winter Key

species	habit	twigs	branchlets
chinense	scrambling, wide-spreading, loosely branched	buff-gray, usually unarmed	light yellowish
halimifolium	erect, spreading, bushy, with moderate shoots	pale, not hairy in the axils; usually spiny	light gray

The Genus **MYRICA** is recognized thus

**SUMMER** : leaves alternate, almost entire, resinous-dotted; flowers solitary in the axils of bracts forming catkins; fruit a small, globose, or ovoid drupe coated with resinous grains or wax.  
 \***Myrica asplenifolia** (*Comptonia*) has leaves that are toothed or pinnatifid, very long and narrow.  
**WINTER** : twigs slender and dotted with resin; pith small, somewhat angled, continuous, green; leaf scars alternate,  $\frac{1}{2}$ -elliptical or a little triangular, somewhat raised, with 3 bundle traces and small or no stipule scars; buds small, solitary, sessile, subglobose or ovoid, with one or two pairs of exposed scales; end-bud lacking.

Summer and Winter Keys combined

species	leaves	fruit	habit	leaf tip	leaf	leaf form	leaf size	twigs
* <i>asplenifolia</i>	elongated, narrow & notched, fernlike	bur-like						
<i>cerifera</i>	short, entire or with few notches	globular covered with wax	tall shrub or small tree to 40'	acute	often persistent			
<i>carolinensis</i>	"	"	low shrub	obtuse	"	ob lanceolate to obovate	fairly large (2-4")	gray
<i>gale</i>	"	conelike catkins enclosed by 2 bracts	"	"	deciduous	ob lanceolate to obovate, serrate near the tip	small (1-1 $\frac{1}{2}$ ")	--

\* given elsewhere as *Comptonia asplenifolia*

N.B. twigs, fruit and habit are sufficient winter identification.

MYRICA

**NEMOPANTHUS MUCRONATUS** is recognized thus

**SUMMER** : leaves alternate, simple, elliptic to oblong, mucronate, entire or slightly toothed, grayed beneath, slender petioled; flowers small, whitish, axillary, on slender peduncles, polygamous, dioecious; fruit a drupe, dull red, subglobose, glabrous, with 4-5 bony nutlets and without sepals at the base, long-stalked.  
**WINTER** : shrub, slender-branched and glabrous; twigs often short, more or less glaucous, with the bark finely fissured in age; leaf scars alternate, clustered at the ends, slightly raised, triangular, with one bundle trace and no stipule scars; buds smallish, ovoid, sessile, solitary, with 2-3 ciliate outer scales.

NEMOPANTHUS --

MYRICA

The Genus **PHILADELPHUS** is recognized thus

**SUMMER :** branches with solid white pith; bark orange, often but not always peeling; leaves opposite, dentate or entire, with 3-5 large veins from the base; flowers white, moderately large, fragrant, terminal on lateral branchlets, with 4 sepals and 4 petals, usually racemose but sometimes solitary or in 2-3 flowered cymes; fruit a 4-valved dehiscent capsule.

#### Summer Key

species	older bark	leaves	flowers	petals	styles	anthers	pedicels & calyx	racemes	habit	twigs
gordoni-	yellowish, pubescent	both sides, dentate	odorless				glabrous			
anus	firm									
lewi-	"	Glabrous, all				"				
virgin-	brown, peeling freely	most entire	double							
alis			single, pink							
var.	"							"		
rosace-										
micro-	thick, entire	solitary or clusters 1-6, not racemes						"		
phyllus	" 1" or less	simple or compound racemes	narrow, long, oblong				glabrous			
falcon-	larger	oblong	far exceed the stamens, deeply divided							
ieri										
zeyheri	"	"	5-7, scarcely fragrant	pure white, broad	divided $\frac{1}{2}$ , longer than stamens as the stigmas broad and prominent	white	"			
coronar-	tapering at base	cream-white 3-5, very fragrant	"	shorter than stamens		yellow	more or less villous, lobes of calyx glabrous except edge			
ius			"							
lemoinei	"	"	3-7, very fragrant	"	" stigmas narrow, divided $\frac{1}{2}$	"	glabrous or scarcely pubescent	short & dense	slender twiggly	
grandi-	large and thin	in cymes, 1-3 flowered, not	"				glabrous			coarse
florus										

The Genus **PHILADELPHUS** is recognized thus

**WINTER** : bark orange or brown, usually peeling; twigs more or less lined, angular; pith moderate, rounded, continuous, pale; leaf scars opposite,  $\frac{1}{2}$ -round, with a thin membrane over the bud, becoming crescent-shaped when this bursts, connected by a line around the twig, with 3 bundle traces and no stipule scars; buds solitary, sessile, with one pair of barely overlapping hairy scales; end-bud lacking.

### Winter Key

species	older bark	fruits	lower pedicels	racemes	leaf scars	young branchlets	pedicels & calyx	buds
<i>gordonianus</i>	yellowish, firm	racemes					slightly pubescent	glabrous
<i>Lewisii</i>	"	"					glabrous	"
<i>falconieri</i>	brown, freely peeling	"	long, often articulated or branched	3-5 fruited loose & open	"			
<i>Zeyheri</i>	"	"	short	"	"			
<i>*lemoinei</i>	"	"	"	3-7 fruited, short & dense	narrow	slender	glabrous or scarcely pubescent	covered* by membrane
<i>coronarius</i>	"	"	"	5-7 fruited, longer	broad	moderate	more or less vilous	
<i>virginicus</i>	"	"	medium	3-7 fruited	"	"	densely pubescent	
<i>grandiflorus</i>	"	cymose		1-3 fruited			glabrous	

N.B. Winter identification is difficult and not fully decisive.

\*There are a number of Lemoine hybrids, for the most part similar in effect to *lemoinei*, except *P. rosace* which has pink or pinkish flowers in spring.

**PHOTINIA VILLOSA** is recognized thus

**SUMMER** : a tall unarmed shrub or small tree; leaves alternate, simple, pinnately veined, finely serrate, stipulate, short-stalked, obovate to oblong-obovate, acuminate, cuneate, glabrous above and villos beneath; flowers white, in corymbs or cymes; fruit a small pome with 4 seeds, open at the top.

**WINTER** : twigs brown, odorless, moderate, with large lenticels, not spiny but with many short spur-3-lobed, raised, with 3 bundle traces and no stipule scars; buds solitary, sessile, ovoid, acute, with about 4 slightly keeled and mucronate scales, often slightly red in midwinter.

*PTELEA TRIFOLIATA* is recognized thus

SUMMER : leaves alternate, petiolate, palmately compound with 3 leaflets; leaflets sub sessile, ovate to elliptic-oblong, entire or obscurely cuneate; flowers small, greenish, in corymbs; fruit suborbicular, a samara, the seed encircled by the wing, in large clusters.

WINTER : a sparse shrub, unarmed; twigs brownish, moderate, terete, warty and dotted, with a rather large whitish pith; leaf scars alternate, raised, rather large, horseshoe-shaped after the membrane is broken by the growing buds, with 3 bundle traces and no stipule scars; buds concealed under a membrane, small, closely superposed in pairs, low-conical, sessile, silvery-silky; end-bud lacking.

*PHYSOCARPUS OPULIFOLIUS* is recognized thus

SUMMER : leaves alternate, simple, broad-ovate, 3-5 lobed, toothed, estipular, glabrous; flowers white, in many-flowered corymbs, with an unpleasant odor; fruit a small capsule, with the follicles inflated and dehiscent along both sutures, glabrous

WINTER : loosely branched shrub with shredding and peeling brown bark, under bark orange; twigs terete, 5-lined from the nodes, moderate, with largish, brownish pith; leaf scars alternate, half elliptical or slightly 3-lobed, raised on a cushion with 5 unequal bundle traces, the lowest one largest, and with small stipule scars on the leaf cushion; fruit often persistent.

*QUERCUS PRINOIDES* is recognized thus

SUMMER : Habit shrubby, spreading; branchlets soon glabrous; leaves short-petioled, pinnately veined, simple ovate-oblong to oblong, acute, cuneate, undulate-dentate with 3-7 pairs small teeth, glabrous above, grayish tomentulose beneath; flowers in catkins; fruit an acorn, sessile, ovoid, enclosed  $\frac{1}{2}$  by the cup, the cup scales tuberculate.

WINTER : twigs moderate, fluted; pith star-shaped in section; buds solitary or collaterally multiple, sessile, globose, ovoid or conical, with numerous 5-ranked scales; leaf scars alternate, rather small,  $\frac{1}{2}$ -round, slightly elevated, with 10-12 scattered bundle traces and small stipule scars.

*PTELEA* -- *PHYSOCARPUS* -- *QUERCUS*

The Genus RHAMNUS is recognized thus

SUMMER : twigs often spiny-tipped; leaves alternate or opposite, with one main vein, serrulate to entire, with stipules; flowers small, greenish, inconspicuous, in axillary clusters; fruit a globose or subglobose drupe.

WINTER : twigs slender, terete with a moderate, white, continuous pith; leaf scars in broken pairs or alternate, crescent-shaped or  $\frac{1}{2}$ -elliptical, small, raised, with 3 bundle traces and minute stipule scars; buds moderate, solitary, sessile, naked or with several scales; twigs often ending in a thorn about the same length as the buds.

#### Summer Key

species	spines	arrangement	buds	twigs	fruitlets	winter buds	fruit
<i>cathartica</i>	present, scarcely longer than the buds	opposite or nearly so	scaly	slender spinescent			
<i>davurica</i>	"	"	"	stout, glabrous			
<i>frangula</i>	unarmed	alternate	naked	pubescent	glabrous, separate or in sessile umbels		
<i>caroliniana</i>	"	"	short	puberulous	several in a cluster, pubescent		
<i>purshiana</i>	"	"	"	pubescent	hoary tomentose	"	
		"	long	"			turbin- ate

#### Winter Key

species	arrangement	branchlets	buds	margin of leaves	fruit	under side of leaves	flowers
<i>cathartica</i>	opposite or nearly so	scaly	serrate, teeth short or obtuse	large, dull, (1-)4-in. thin, broad-ovate to elliptic	light green, with 2-3 pairs of ascending, curving veins		
<i>davurica</i>	"	"	"	"	lustrous, firm, narrow elliptic to oblong	gray-green	
<i>frangula</i>	alternate	unarmed	naked	usually entire	lustrous, oval to obovate, acute to obtuse	with 8-9 pairs of veins	sometimes solabrous in peduncled cymes, pubescent
<i>caroliniana</i>	"	"	"	nearly entire	peduncles thick, acute	8-10 pairs of veins	
<i>purshiana</i>	"	"	"	"	peduncles shorter than the petiole	"	8-15 pairs of veins

**RHODOTYPOS KERRIOIDES** (syn. *R. scandens*) is recognized thus

**SUMMER** : leaves opposite, simple, ovate to ovate-oblong, acuminate, base rounded, sharply doubly serrate; flowers white, large, with 4 suborbicular petals and 4 serrate sepals; fruit a dry drupe, shiny brownish-black, obliquely ellipsoid, in clusters of four set above the persistent sepals.

**WINTER** : a loosely branched shrub; twigs moderate, glabrous, red-brown, somewhat lenticular; leaf scars opposite, crescent-shaped, moderate sized, ciliate at the top and connected by a ciliate line, with 3 bundle traces and no stipule scars; buds moderate, becoming collaterally multiple and at length very slightly stalked, ovoid, glabrous, with about 6 pairs of scales.

The Genus **RHUS** may be recognized thus

**SUMMER** : leaves alternate, pinnately compound, three to many-parted or simple, aromatic when crushed; flowers small, in terminal or axillary panicles; fruit a globose or compressed drupe, hairy or resinous, in compact clusters; twigs usually coarse.

**Summer Key**

species	nature	fruits	habit	leaves	inflorescence	leaf margin	leaf rachis	leaf surface	twigs
radicans	poisonous	glabrous	trailing or climbing	three-parted	axillary			glabrous	
vernix	"	"	erect	many-parted	"		"	"	
aromatica	non-poisonous	red, hairy	"	three-parted	"			pubescent	
copallina	"	"	"	many-parted	terminal	entire or obscurely serrate	winged	glossy	
javonica	"	"	"	parted	"	coarsely serrate	"	brown-hairy	
glabra	"	"	"	"	"	coarsely serrate	"	beneath	glabrous
typhina	"	"	"	"	"	"	not winged	glaucaous	glaucaous
cotinus	"	black	"	simple	"	entire	"	"	densely hairy
							glabrous	glabrous	glaucaous

The Genus RHUS is recognized thus

WINTER : twigs round or bluntly 3-sided, slender to very stout, pungently aromatic when cut or bruised, either very hairy or with prominent lenticels or smooth, leaf scars alternate, round or crescent-shaped or C-shaped and encircling the buds, more or less raised, with numerous bundle traces sometimes collected in groups and without stipule scars; buds moderate or rather small, sessile, round-ovoid, hairy and indistinctly scaly or with 3-4 evident scales; end-bud often lacking.

Winter Key

Species	habit	fruits	sap	leaf scars	twigs	lenticels	twig color
radicans	poisonous, trailing or climbing by <u>aerial</u> roots	glabrous, whitish					
vernix	poisonous, erect shrubby	"					
aromatica	non-poisonous, erect, shrubby	axillary red-hairy	offensively pungent	elevated, round, covering buds			
cotinus	"	terminal, black, in plumose clusters					
copallina	"	terminal, red-hairy nodding		elevated			
Javanica	"	terminal, erect	"	not elevated, U-shaped hairy	numerous, prominent, almost warty	orange-yellow	
typhina	"	"	"	not elevated, C-shaped hairy	sparsely prominent	dark	
glabra	"	terminal curved	"	"	densely concealed by hairs	brown to black	
			"	"	not hairy	red, glaucous	
					prominent		

The Genus RIBES may be recognized thus

SUMMER : unarmed or prickly shrubs; leaves 1-2" broad, alternate, petioled, simple, with 3-7 notched lobes, palmately veined, estipulate; flowers perfect or dioecious, 5-merous, in few to many flowered racemes, rarely clustered or solitary; fruit a small, sour, juicy, many-seeded berry crowned by the remains of the calyx.

WINTER : stems prickly or unarmed; twigs rounded, moderate in size, with decurrent ridges below the nodes; buds small, ovoid, solitary, sessile or becoming short-stalked, with about 6 loose scales; leaf scars alternate, linear or U-shaped or broadly crescent-shaped, slightly raised, with 3 bundle traces and no stipule scars.

Summer Key

species	habit	flower clusters	flowers	floral color	under side of leaves	young branchlets	leaf form	sepals
alpinum	low, dense twiggly	erect racemes	short, inconspicuous	red, pink	white	pubescent, often tomentose	ovate to roundish	less than $\frac{1}{2}$ the length of calyx tube
sanguineum	loose, open	pendulous racemes	showy	or white	yellow	pubescent	roundish to obovate	more than $\frac{1}{2}$ as long as calyx tube
odoratum	"	"	"	"	"	"	"	"
aureum	"	"	"	"	"	"	"	"

N.B. The gooseberries have spines at the nodes and prickly fruits and more narrow leaf scars, while the currants are unarmed or seldom prickly

Winter Key

species	habit	leaf scars	leaves in bud	branchlets	buds
alpinum	low, dense twiggly	narrow	plaited	nearly glabrous, buff	stalked
sanguineum	loose, open	broad	"	pubescent, often sparingly glandular and aromatic	"
odoratum	"	"	convolute	pubescent	"
aureum	"	broad	"	glabrous or puberulous	not stalked

The Genus *ROSA* is distinguished thus

SUMMER : twigs thorny, rarely unarmed; leaves alternate, pinnately compound, stipulate; flowers terminal, solitary or in corymbs, floral parts in 5's, pistils numerous, enclosed in an urn-shaped hip which becomes fleshy and berrylike enclosing several - to many-bony achenes.

WINTER : mostly shrubs, occasionally trailing or scrambling; branches moderate, terete, armed with prickles, often hooked prickles; leaf scars low, broadly crescent-shaped or almost linear, with 3 bundle traces and no stipule scars.

Summer and Winter Keys combined

species	habit	number of leaflets	leaflets	flowers	branchlets	prickles	branches	akenes	stipules	fruit
<i>wichuriana</i>	prostrate, evergreen	nine	lustrous, glabrous, obtuse, broad pubescent, obovate to oblong	small, white in large clusters						small in large clusters
<i>multiflora</i>	high climbing, deciduous	seven								
<i>setigera</i>	deciduous, upright, with arching branches	3, rarely 5		ovate, oblong, large pubescent on veins beneath			recurved	red		
<i>blanda</i>	erect, bushy									
<i>rugosa</i>	"		very rugose thorny				unarmed suckers			
<i>acicularis</i>	"	3-7	oblong	not rugose	—	—	needle-like with prickles			
<i>nitida</i>	"	7-11	elliptic	"	—	—	tomentose nearly straight			
<i>carolina</i>	"	5 rarely 7	red elliptic	dull above	—	—	glabrous	"	flat	
<i>canina</i>	"	5-7	oval	green singly serrate	—	—	glandular hispid	"	"	
<i>rubiginosa</i>	"	5-7	broadly oval	doubly serrate, glandular, fragrant	—	—	flatened at base or strongly hooked	"	"	only in bottom of hip
<i>spinosissima</i>	"	usually 9		very small, base rounded to pink	thorns much dilated	thorns not dilated				
<i>hugonis</i>	"	5-13	red-brown	yellow single flowerings	flowering branches	of 2 kinds				narrow black with divergent & dilated auricles
<i>zanthina</i>	"	7-13	"	yellow double flowerings	"	"	bristly	"	"	red
				"	"	"	base least bristly	"	"	"
				"	"	"	never bristly	"	"	"
										ROSA

The Genus RUBUS may be recognized thus

**SUMMER** : stems prickly and short-lived; leaves alternate, 3-parted or pinnately compound and with stipules; flowers showy, white to pink, in racemes or panicles or corymbs or solitary, usually terminal; floral parts in fives; fruit an aggregate of drupelets.

**Summer Key :**

species	habit	leaves	fruit surface	flowers	stems	fruit	prickles
<i>odoratus</i>	erect unarmed	simple					
<i>spectabilis</i>	erect armed	compound	orange	solitary, nodding, large	glabrous, with numerous fine prickles below	hollow, separating from the torus	
<i>occidentalis</i>	"	"	black	moderate, in many-flowered corymbs	"	"	short
<i>idaeus</i> , var. <i>striatus</i>	"	"	black	moderate, in moderate, in tomentu- lose	"	"	
<i>allegheniensis</i>	"	"	black	moderately erect	glandular pubescent	not hollow, retaining the torus	few, broad
<i>caesius</i>	creeping or prostrate	compound, with narrow stipules attached to petiole	"	in corymbs, few-flowered, pubescent, glandular & prickly	glaucous, terete, of a few large drupelets	weak, sparse, scattered	
<i>procumbens</i>	"	compound	"	"	sub-terete, glaucous	"	stout, recurved

**N.B.** This group of Rubus does not develop flowers on first-year wood.

**RUBUS** -- **Summer Key**

**The Genus RUBUS** is identified thus  
**WINTER** : twigs short-lived, soft-wooded, armed with prickles, moderate, often 5-angled, leaf scars  
 alternate, torn and irregularly shrivelled, on a much-raised and persistent petiole base, with  
 the bundle traces completely indistinct and no stipule scars.

Winter Key

species	habit	bark	stems	prickles	canes
<i>odoratus</i>	erect unarmed	shredding	villous and glandular		
<i>idaeus</i> *	"	not shredding	finely tomentose, straw-colored	more straight, numerous, bristly-like	at most very stoloniferous
<i>spectabilis</i>	erect, armed	"	glabrous, with numerous fine prickles below		
<i>occidentalis</i>	"	"	very glaucous, purple	short, stout, and persistent, strongly hooked	recurving, rooting at the tip
<i>allegheniensis</i>	"	"	stellate-pubescent near the apex, grooved,	more straight, especially on stems, persistent	at most very stoloniferous
<i>caesius</i>	creeping or prostrate	"	glaucous, terete, slightly puberulous	weak, sparse, scattered	
<i>procumbens</i>	"	"	sub-terete, glabrous	stout, slender	

\* consider *strigosus* as a variety of *idaeus*

RUBUS -- Winter Key

The Genus *SALIX* is recognized thus

SUMMER : TWIGS very flexible; leaves alternate, petiolate or sessile, mostly lanceolate, toothed or entire, often stipulate; flowers in catkins with or before the leaves; fruit a 2-valved capsule.

WINTER : Bark smooth, wood soft, twigs very flexible; leaf scars alternate, low, U-shaped, with 3 bundle traces and short, if any, stipule scars; buds oblong, appressed, sessile, solitary, with one cap-like scale which splits on the inside next the twig.

Summer and Winter Keys combined

species	mature leaves	underside of leaves	buds	habit	branchlets	leaf form	leaf margin	leaf tip	fruits
<i>caprea</i>	glabrous	glaucous or glaucescent	stout & reddish	tree or shrub	young branchlets pubescent	elliptic	serrate	acute or abruptly acuminate	
<i>discolor</i>	"	"	more slender and nearly black	shrub	young branchlets tomentose	generally oblong	"	more or less acuminate	
<i>irrorata</i>	"	"	white-villous		blobby	lanceolate to linear-lanceolate	obscurely serrulate	very sub-entire	dull straw-color bottle-necked
<i>lucida</i>	green	moderately large			lustrous, yellow-brown	ovate-lanceolate to oblong-lanceolate with glandular petiole	glandular-serrate	long-acuminate	lustrous straw-color gradually
<i>pentandra</i>	"	"	"		polished green or chestnut	broadly ovate to oblong-lanceolate with a glandular petiole	"	shortly acuminate	
<i>incana</i>	villous with loosely appressed hairs	moderately pubescent	orange-red	a large shrub to 20' or 40'	orange-red linear	serrulate near apex, revolute			
<i>humilis</i>	"	glaucous and soft pubescent	small to 3 mm.	a shrub 3' to 9' or tomentose	ob lanceolate to oblong-lanceolate	entire or subentire			
<i>tristis</i>	"	glabrescent	small to 2 mm.	a shrub to 18"	glabrescent	narrowly ob lanceolate to linear-lanceolate			

Also see *Salix* among the trees

The Genus *SAMBUCUS* may be recognized thus

**SUMMER** : open shrubs with coarse, angled twigs; pith large and soft, continuous; leaves opposite, pinnately compound; leaflets serrate; flowers small, in terminal compound corymbs or panicles;

**WINTER** : branches stout; corolla rotate; fruit a berry-like drupe with 3-5 nutlets.   
 WINTER : branches stout; pith large and soft, continuous; leaf scars opposite or whorled, broadly crescent-shaped or triangular or rhomboid, large, low, more or less connected around the twig, with 3-5-7 bundle traces and no stipule scars; buds solitary or multiple, the larger ones stalked, ovoid, or depressed with 3-5 pairs of scales; end-bud usually lacking.

#### Summer Key

species	fruit	flowers	twigs	foliage color	under side of leaves	leaflets	odor
<i>racemosa</i>	red	convex cymes often 4-angled	—	bright green	glabrous	usually 7	slight
<i>canadensis</i>	black	flat cymes	terete	—	pubescent	usually 5	disagreeable
<i>nigra</i>	black	"	"	dark green	while young	—	when bruised

♂

#### Winter Key

species	pith	branches	lenticels	odor
<i>racemosa</i>	brown	light brown	—	—
<i>canadensis</i>	white	yellow gray	moderate	slight
<i>nigra</i>	white	gray	numerous and prominent	strong and disagreeable when crushed

#### SAMBUCUS

The Genus SORBARIA is recognized thus

SUMMER : leaves alternate, pinnately compound, thin, sharply serrate, stipulate; leaflets lance-oblong; flowers white, in large terminal panicles, floral parts in fives; fruits tan-colored, dehiscent capsules.

WINTER : low shrubs, not twiggy nor much branched; twigs rather stout for the size of the plant, glabrous and terete; pith rather large, brown, continuous; leaf scars alternate, relatively large, rounded or irregular in form, scarcely raised, with 3 bundle traces and no stipule scars.

Summer and Winter Keys combined

species	twigs and buds	habit	flowers	fruits	leaf margin
<i>lindleyana</i>	red-brown	shrub to 8'	in mid-summer clusters 8-12"	on recurved pedicels	doubly serrate
<i>sorbifolia</i>	gray-brown	shrub to 5'	late spring, clusters 5-12"	upright	"
<i>aitchisonii</i>	red to purple	shrub to 7' or 10'	late summer, clusters 8-12"	"	singly serrate

**SORBARIA**

The Genus SPIREA may be recognized in  
SUMMER : leaves alternate, simple, dentate or serrate or sometimes lobed, rarely entire, with short  
petioles and no stipules, pinnately veined; flowers small in umbel-like racemes, corymbs or  
panicles, floral parts in fives; fruits tan-colored capsules, dehiscent at the top.

Summer Key

species	flowers	leaf margin	leaves	floral color	inflorescence
<i>van houttei</i>	umbels, with the leaves, on new shoots	incisely serrate, often lobed	glabrous, apex acute	white	
<i>hypericifolia</i>	umbels before leaves, entire on old wood	"	"	"	
<i>thunbergii</i>	"	—	linear-lanceolate, glabrous	"	3-5 flowered, sessile
<i>arguta</i>	"	—	oblong, finely pubescent when young	"	many-flowered, lower umbels stalked
<i>prunifolia</i>	"	denticulate	oblong, pubescent beneath	"	umbels all sessile, 3-6 flowered
<i>*bumalda</i>	corymbs at tips of branches	"	"	pink or white	flat-topped corymbs
<i>tomentosa</i>	panicles	unequally serrate	tawny beneath, ovate	pink	brownish tomentose
<i>billardii</i>	"	—	pubescent, oblong	"	tomentulose
<i>salicifolia</i>	"	sharply doubly serrate	glabrous, lanceolate	"	"
<i>alba</i>	"	sharply serrate	glabrous, elliptic	white	tomentose
<i>latifolia</i>	"	sharply serrate	glabrous, oblanceolate	"	glabrous

\**bumalda* var. *antony waterer* is a better color than the type.

The Genus SPIREA is recognized thus:

shrubs, low and little branched or with slender, arching, wand-like branches; twigs terete or angled from the nodes, more or less zigzag; with small, rounded, continuous, buds small, usually solitary or occasionally collaterally multiple, sessile, globose or spindle-shaped, with about 6 outer scales; leaf scars alternate,  $\frac{1}{2}$ -round or crescent shaped, minute, often much raised, with one bundle trace and no stipule scars.

Winter Key

species	buds	twigs	branchlets and buds	lateral twigs	bud arrangement	bark color	pubescence	vestiges of inflorescence
<i>van houttei</i>	conical, with several outer scales	slender terete	glabrous					
<i>hypericifolia</i>	ovoid	sub-terete	pubescent					
<i>prunifolia</i>	"	more or less angled	"	fine, zigzag	often collate orally multiple	gray	gray or dingy	
<i>arguta</i>	"	"	puberulous or glabrescent	filiform-numerous	"	red-brown		
<i>thunbergii</i>	"	"	"	"	solitary	yellow-brown	"	
<i>bumalda</i>	"	"	not glaucous	neither very slender nor numerous	solitary or collaterally multiple	"	"	
<i>tomentosa</i>	"	"	brown tomentose	"	"	"	"	
<i>billiardii</i>	"	"	pubescent	"	"	gray-brown	"	
<i>salicifolia</i>	"	"	puberulous	"	"	yellow-brown	"	
<i>alba</i>	"	"	"	"	"	brown	"	
<i>latifolia</i>	"	"	glabrous	"	"	red-brown	scanty	
						bright or dark	none	
						red-brown		

**STAPHYLEA TRIFOLIA** is recognized thus

SUMMER : leaves opposite, pinnately compound with 3 leaflets, stipulate and stipellate, lateral leaflets sessile, unequally serrulate, elliptic to ovate; the stipules deciduous; flowers regular, in terminal panicles, sepals and petals of equal length, greenish-white or slightly pinkish, inconspicuous; fruit an inflated, membranous capsule, 3-lobed, dehiscing, with slightly several shiny, bony seeds.

WINTER : twigs with smooth, striped bark, moderate, terete, glabrous, with a rather large pith; leaf scars opposite,  $\frac{1}{2}$ -round, slightly raised, with 3-7 bundle traces which are compound, and the stipule scars  $\frac{1}{2}$ -round or elongated; buds ovoid, with 2-4 scales, solitary, sessile, glabrous; the end-bud usually lacking.

**STEPHANANDRA FLEXUOSA** (syn. *incisa*) is recognized thus

SUMMER : leaves alternate, 2-ranked, serrate and deeply lobed, stipulate; flowers small, greenish-white, in loose terminal panicles, the bracts awl-like and shorter than the slender peduncles.

WINTER : branches slender, zigzag, nearly round or slightly 5-lined from the nodes, red-brown; leaf scars alternate, 2-ranked, small,  $\frac{1}{2}$ -round or triangular, a little raised, with 3 bundle traces and rather large stipule scars; buds superposed, small, ovoid or oblong, with about 4 outer scales.

The Genus **SYMPHORICARPUS** is recognized thus

SUMMER : leaves opposite, short-petioled, entire or occasionally lobed on vigorous shoots, and without stipules; flowers small, axillary, usually forming clusters or terminal spikes; fruit a 2-seeded berry.

WINTER : deciduous shrubs with slender, arching branches, more or less pubescent; pith small, brownish, branches the first season, ovoid-oblong, more or less compressed, sessile, with about 3 pairs of keeled scales; leaf scars opposite,  $\frac{1}{2}$ -round, small, ragged or torn, raised, partly connected by transverse ridges, with one indistinct bundle trace and no stipule scars.

Summer and Winter Keys combined

species	inflorescence	fruit	pith	corolla	young branchlets
racemosa	terminal racemes	white	excavated	pubescent inside	glabrous
vulgaris	axillary clusters	red	continuous	glabrous inside	pubescent

The Genus **SYRINGA** is distinguished thus

**SUMMER** : shrubs or small trees with opposite, petiole leaves having the margins entire; flowers and fruits in terminal or lateral panicles on wood of the previous season; calyx and corolla with four parts, corolla saucer-shaped with a tube and four valvate lobes; stamens two; fruit an oblong capsule splitting in two parts.

**WINTER** : deciduous shrubs or small trees; twigs moderate or slender; pith moderate, pale in tone; buds usually solitary, sessile, ovoid, with about four pairs of exposed scales, end-bud frequently absent and the branches forked; leaf scars opposite, crescent or shield-shaped, raised, rather small, with one compound bundle-trace and no stipule scars.

Winter identification of species is uncertain and incomplete at present.

species	flowers	habit	inflor- escence	corolla lobes	panicles	underside of leaves	corolla tube	branchlets	anthers	leaves	flower clusters
pekinensis	cream-white corolla tube short	large shrub					little long- er than calyx			cune- ate	
amuren- sis	"	"					base rounded			base rounded	
japon- ica	"	small bark cher- ry-like				"				subcordate	
emodi	not yellow- ish, corolla tube longer than calyx	shrub, with simple leaves	terminal, reflexed, leafy at stamens the base protruding		papillose	much longer than calyx					
reflexa	"	"	"	erect or spreading stamens not pro- truding	not papil- lous	"					
yunnan- ensis	"	"	"	"	not papil- lous	"				"	
josi- kaea	"	"	"	"	not papil- lous	"				"	
wolfi	"	"	"	"	not papil- lous	"				"	
swegin- zowi	"	"	"	"	not papil- lous	"				"	
villosa	"	"	"	"	not papil- lous, glau- cescent color dark	"				"	
persica	"	"	"	"	not papil- lous	"				"	
chinensis	"	"	"	"	not papil- lous	"				"	
vulgar- is	"	"	"	"	not papil- lous	"				"	
oblata	"	"	"	"	not papil- lous	"				"	
meyeri	"	"	"	"	not papil- lous	"				"	
palibin- iana	"	"	"	"	not papil- lous	"				"	
micro- phylla	"	"	"	"	not papil- lous	"				"	
pinnati- pinnata	"	shrub, leaves compound	"	"	not papil- lous	"				"	

The Genus *TAMARIX* is distinguished thus

**SUMMER** : a very fine-textured shrub or tree; branches very slender, terete, the ultimate small branchlets falling with the leaves; leaves small, almost scale-like, often sheathing; flowers small, short-pedicelled or sessile in dense racemes collected in terminal panicles; fruit a dehiscent capsule with many minute seeds and with a tuft of hairs at the apex.

**WINTER** : shrubs or small trees with slender branches; pith small, not central; twig lacking leaf scars, bundle traces or stipule scars; the dilated base of the alternate leaves persisting; buds small, sessile, rounded, appressed, solitary or concentrically multiple, with about 3 scales.

Summer Key

species	flowers	floral parts	foliage	petals	branches	disk	blooming season
<i>parviflora</i>	lateral racemes on last year's wood	in 4's	blue-green		arching		earliest of all
<i>gallica</i>	terminal panicles on wood of current year	in 5's	bright green or yellow-green	deciduous	spreading, glabrous	5-angled or 5-lobed	
<i>pentandra</i>	terminal panicles, slender			glaucous or pale green	persistent upright	10-lobed	

Winter Key

species	habit	twigs and buds	buds
<i>pentandra</i>	upright	purple	glabrous, small
<i>parviflora</i>	arching	dark purple	glabrous, small
<i>gallica</i>	spreading	red-brown	small, globose and very hairy, multiple

The Genus VACCINIUM is recognized thus

SUMMER : leaves alternate, short-petioled, glabrous or puberulent beneath, entire or serrate, narrow-elliptic to oblong-lanceolate or obovate, acute both ends; flowers axillary or terminal, solitary or in racemes, the corolla cylindric and  $\frac{1}{2}$ -lobed; fruit a fleshy, many-seeded berry with persistent calyx lobes, bloomy blue-black.

WINTER : unarmed, odorless shrubs; branchlets slender or very slightly angular, somewhat hairy, brown or greenish tinged red, nearly glabrous and smooth; leaf scars alternate, very small,  $\frac{1}{2}$ -round or crescent-shaped, slightly raised, with one bundle trace and no stipule scars; buds small, ovoid, solitary, sessile, with two or more pointed scales; end-bud usually lacking.

Summer and Winter Keys combined

species	habit	branchlets	buds	leaves	flowers	habitat
<i>corymbosum</i>	tall shrub	angled and warty	ovoid, scales pointed	glabrous beneath, entire or nearly so	cylindric corolla, longer than broad	moist woods or bogs
<i>pennsylvanicum</i>	low and dwarf	grooved above buds, puberulous	"	glabrous both sides, serrulate with bristle-pointed teeth	short-cylindric, broader than long	dry, sandy slopes

VACCINIUM

The Genus VIBURNUM is recognized thus

SUMMER : shrubs or small trees; leaves opposite, rarely whorled, entire, dentate, or lobed, usually without stipules; flowers small, white or pinkish, in umbel-like or paniculate compound cymes, floral parts in 5's; fruit a one-seeded drupe with the stone usually compressed.

Summer Key

species	foliage	branchlets	fruit	leaves	leaf form	flower clusters	petiole	leaf scars	winter leaf buds	leaf color
<i>americanum</i>	lobed	glabrous	red	glabrous below	—	—	—	—	with broad shallow glands	—
<i>opus</i>	"	"	"	pubescent below	—	—	—	—	with narrow grooves and large glands	—
<i>acerifolium</i>	"	pubescent	black	bluish black	densely pubescent below & black dotted	—	—	—	—	—
<i>rhytidophyllum</i>	not lobed	stellate-pubescent	—	sub-evergreen	—	—	—	—	—	—
<i>cassinoides</i>	not lobed	pubescent	—	remotely dentate	—	peduncles shorter than the cyme	—	—	soon leaden	—
<i>lentago</i>	"	"	"	sharply finely serrate	—	umbel-like flat, sessile	—	—	leaden	—
<i>prunifolium</i>	"	glabrous, rigid	"	"	"	with broad, wavy margin	—	—	—	—
<i>rufidulum</i>	"	rigid	"	"	"	not marginated	—	—	leaden tinged with red	—
<i>molle</i>	"	puberulent blue-black	beneath	dull pubescent	broadly ovate	—	—	—	—	—
<i>dentatum</i>	"	glabrous	"	lustrous red	—	—	—	—	—	—
<i>dilatatum</i>	"	pilose	red	both sides pubescent, with more than 5 pairs of veins	"	—	—	—	—	—
<i>sieboldii</i>	"	pubescent	red changes black	glossy, veins impressed	oblong	all flowers elliptic, paniculate	—	—	broad, meeting, relatively narrow	lively bright
<i>tomentosum</i>	"	stellate tomentose	"	"	"	marginal flowers sterile & enlarged	—	—	—	green
<i>lantana</i>	"	scurvy pubescent	"	closely dentate	"	umbel-like, flat, of small flowers	—	—	naked	dark green
<i>carlesi</i>	"	stellate-tomentose	"	coarsely dentate	"	umbel-like, pinkish, large	—	—	—	gray-green
<i>burkwoodi</i>	"	puberulous	"	glabrous & glossy	"	very fragrant white, flushed	—	—	—	dark green

The Genus VIBURNUM may be recognized thus

WINTER : twigs moderate, more or less hexagonal, pith continuous, white or brownish; leaf scars opposite, crescent-shaped, raised or meeting or connected, with 3 bundle traces and no stipule scars; buds solitary or rarely superposed, usually stalked, scaly or naked, ovoid or oblong.

#### Winter Key

species	foliage	branches	buds	bud scales	leaf scar	bud form	twig	bark	bud color	fruit
<u>rhytidophyllum</u>	persistent									
<u>lantana</u>	deciduous		naked		narrow		stout, densely pubescent, scurfy			
<u>carlesii</u>	"		"		"	"	more slender, stellate-tomentose			
<u>mollis</u>	"		scaly imbricate		"	"	glabrous, gray	peeling		
<u>dentatum</u>	"		"	"	"	"	"	firm		
<u>acerifolium</u>	"		"	"	"	"	squared pubescent	"		
<u>prunifolium</u>	"		rigid	"	valvate	"	oblong or flask-shaped, pubescent, rusty-pubescent, stout, rigid	a little leaden, rusty, dried		
<u>rufidulum</u>	"		"	"	"	"	rusty-pubescent, stout, very hairy, hispid			
<u>dilectum</u>	"		more flexible	"	scaly hispids parted short	relatively narrow	sub-ovoid			
<u>sieboldii</u>	"		"	"	scaly, closely valvate	broad, meeting	ovoid			
<u>g. tomentosum</u>	"		"	"	not hispid sack	relatively narrow	sub-ovoid			
<u>cassinoides</u>	"		"	"		"	brown, stellate-tomentose	brown		
<u>lentago</u>	"		"	"		"	dull brown, flask-shaped	brown		
<u>opulus</u>	"		"	"		"	dull leaden, scurfy	leaden		
<u>americanum</u>	"	"	"	"		"	oblong, glabrous	red to green	remains	
						"	snort-pointed ovoid	loses color	plump and bright red	

The new variety *burkwoodi* is recognized by Mr. Rehder as a variety of *carlesii*, from which it is easily distinguished by the less hairiness; twigs being puberulous or glabrous rather than tomentose.

The Genus WEIGELA is recognized thus

SUMMER : leaves opposite, short-petiolated to sessile, serrate, without stipules; flowers in axillary cymes, often panicled at the end of branchlets; corolla funnel-form, floral parts in 5's; fruit a 2-valved capsule.

WINTER : branches moderate, with solid pith, bark scurfy gray, with rather large circular lenticels; twigs straw-colored or brownish, with 2-4 decurrent hairy ridges from the nodes; leaf scars opposite or in whorls of three, broadly shallow crescent-shaped, connected by lines, with 3 bundle traces and no stipule scars; buds with several pairs of pointed scales, often superposed, sessile, oblong, appressed; fruits persistent, linear, 2-valved, dehiscent capsules, with the central partition exposed and extending.

Summer Key

species	branchlets	flowers	leaves	under side of leaves
<i>Diervilla lonicera</i>	glabrous or nearly so, terete	yellow	hairy on edges	
<i>floribunda</i>	pubescent		dark crimson, sepal linear, pubescent above	villous pubescent chiefly on veins
<i>amabilis</i>	with 2 rows of hairs		distinct, seeds winged	pubescent or tomentose on veins

Winter Key

species	branchlets	fruiting capsule
<i>Diervilla lonicera</i>	glabrous	glabrous, slender-beaked
<i>amabilis</i>	with 2 rows of hairs	glabrous
<i>floribunda</i>	pubescent or with hairs	pubescent

XANTHOCERAS SORBITOLIUM is recognized thus

SUMMER : shrub or tree; leaves alternate; pinnately compound; the leaflets opposite, sessile, serrate; flowers showy white with a red or yellow blotch at the base of the petals, polygamous, in racemes, slender-stalked, the upper flowers fertile, lower ones usually sterile; fruit a green, 3-valved capsule

WINTER : a tree-like shrub; twigs moderate, terete, coarsely lenticular, glabrous; leaf scars alternate, 3-elliptical, moderate, raised, with 3 large bundle traces and no stipule scars; buds moderate, solitary, sessile, round-ovoid, with about 6 more or less fringed or toothed scales, glossy chestnut brown.

XANTHORRHIZA APIIFOLIA (syn. *simplicissima*) is recognized thus

SUMMER : a small, low shrub with bitter bark and yellow root; leaves alternate, clustered, long-stalked, 3-parted, incisely toothed, celery-like; flowers brownish-purple, very small, in terminal pendulous compound racemes; fruit a one-seeded follicle, dry and dehiscent.

WINTER : twigs terete, moderate, smooth; leaf scars alternate, low, shallowly U-shaped, more than half encircling the twig, with 10-12 bundle traces and no stipule scars; buds very unequal, the terminal bud enlarged, spindle-shaped, with about 5 mucronate scales, the lateral buds small, solitary, sessile, ovoid-oblong, compressed and appressed, with three blunt scales.

ZANTHOCERAS AMERICANUM is recognized thus

SUMMER : aromatic shrub or small tree; young branchlets pubescent, with large prickles in pairs below the nodes; leaves alternate, pinnately compound with 5-11 leaflets; leaflets opposite, ovate or elliptic, acuminate, entire, pubescent beneath, with pellucid dots; flowers before the leaves, dioecious, small, yellow-green, in axillary fascicles on two-year wood; fruit blackish.

WINTER : at the base; twigs moderate or a little stout, terete, with a creamy white pith; leaf scars alternate, broadly triangular or 3-lobed, scarcely raised, with a conspicuous articular membrane, with three bundle traces and no stipule scars; buds small to moderate, rusty-red, woolly, superposed, sessile, globose, with indistinct scales.

## KEY TO THE WOODY CLIMBERS WHEN IN FOLIAGE

A. Leaves evergreen.  
leaves opposite, oval-oblong, smallish, toothed, pinnately  
veined . . . . . Euonymus  
Leaves alternate, ovate, often lobed but not toothed, palmately  
veined or at least with 3 veins from the base . . . Hedera

AA. Leaves deciduous.  
B. Leaves opposite.  
C. Leaves compound.  
Climbing by aerial roots or by tendrils at the tip  
of the leaves . . . . . Bignonia  
Climbing by twining petioles or stems . . . . . Clematis  
CC. Leaves simple.  
Climbs by twining stems or occasionally by aerial rootlets.  
Sap milky . . . . . Periploca  
Sap not milky  
Leaves entire, short-stalked or sessile . . . . . Lonicera  
Leaves toothed or lobed, distinctly petiolate.  
Margin of leaves sparsely toothed, almost entire;  
leaf scars horseshoe-shaped . . . . . Decumaria  
Margin of leaves distinctly serrate; leaf scars  
crescent-shaped . . . . . Hydrangea  
Margin of leaves dentate; leaf scars C- or  
V-shaped . . . . . Schizophagma

BB. Leaves alternate  
D. Stems prickly.  
Leaves compound, margin toothed; habit scrambling . . . . . Rosa  
Leaves simple, parallel-veined, margin entire; climbing  
by paired tendrils . . . . . Smilax

DD. Stems not armed.  
E. Leaves compound.  
F. Leaves palmately compound.  
Leaflets 5, entire on the margin; climbs by  
twining . . . . . Akebia  
Leaflets 3-5, toothed on the margin; climbs by  
tendrils or adhesive discs; pith white . . . Ampelopsis

FF. Leaves pinnately compound.  
G. Leaflets three.  
Leaflets lobed or stipuled, lobes entire, hairy  
on the margin; fruit bean-like . . . . . Pueraria  
Leaflets sparsely and coarsely  
toothed; berries white (poisonous). . . Rhus radicans

GG. Leaflets more than 3, short-stalked.  
Margin entire . . . . . Wisteria  
Margin toothed . . . . . Bignonia

EE. Leaves simple.  
H. Leaves palmately veined.  
Leaves more or less lobed but not toothed; fruit  
with a flattened, curved stone; twining.  
Flowers with 6-8 petals and 12-24 stamens;  
leaves peltate . . . . . Menispermum  
Flowers with 6 petals and 6 stamens; leaves  
not peltate . . . . . Cocculus

Leaves lobed and toothed.  
Pith white; climbs by aerial rootlets and  
discs . . . . . Ampelopsis  
Pith brown; climbs by elongated tendrils,  
usually forked . . . . . Vitis  
Leaves not lobed nor toothed, - large, thin, ovate,  
flowers peculiar pipe-shaped . . . . . Aristolochia

HH. Leaves pinnately veined

I. Leaf margin entire

Leaves often hastately lobed or divided  
at the base; odor rank when crushed . . .

*Solanum*

Leaves not lobed nor divided at the base; flow-  
ers and fruits small, in panicles . . . . . *Polygonum*

II. Leaf margin toothed

Leaves large and coarse; marginal teeth  
bristle-tipped, petioles red . . . . . *Actinidia*

Leaves moderate in size, finely toothed but  
not bristle-tipped . . . . . *Celastrus*

## KEY TO THE WOODY CLIMBERS IN WINTER

A. Stems with prickles  
Trailing or scrambling; prickles stout, curved; shoots terete and with a relatively large pith . . . . . *Rosa*  
Climbing by stipular tendrils or twining; prickles slender, black; tendrils also present; shoots angled and without pith, i.e. endogenous as in a cornstalk . . . . . *Smilax*

AA. Without prickles  
B. Climbing by tendrils or twining petioles.  
C. Climbing by tendrils only; tendrils forked, not thickened at tip; leaf scars alternate.  
    Hard-wooded, with much-flaking bark; pith brown . . . . . *Vitis*  
    Soft-wooded, with bark not flaking or only slightly so; pith white . . . . . *Ampelopsis*

CC. Petioles of leaves twining and assisting; stems strongly angled or ridged; leaves opposite, not disarticulating though dying . . . . . *Clematis*

BB. Climbing by aerial rootlets or discs.  
D. Leaf scars alternate.  
    Leaf scars 2-ranked, rounded, with many bundle traces in an ellipse, and with long, narrow stipule scars; pith white . . . . . *Ampelopsis*  
    Leaf scars not 2-ranked nor rounded.  
        Leaf scars U-shaped; buds with about 2 fleshy scales; leaves evergreen . . . . . *Hedera*  
        Leaf scars broadly crescent-shaped or shield-shaped; buds stalked and naked (poisonous) . . . . . *Rhus*

DD. Leaf scars opposite.  
    Leaves evergreen . . . . . *Euonymus*  
    Leaves deciduous  
        Leaf scars shield-shaped, with one C-shaped bundle trace and the buds connected around the twig by a hairy line; stems terete . . . . . *Bignonia*  
        Leaf scars crescent-, U-, or horseshoe-shaped.  
            Buds with 4-6 outer scales; leaf scars crescent-shaped with 3 bundle traces . . . . . *Hydrangea*  
            Buds with 2 outer scales; scars U-shaped with 5 bundle traces . . . . . *Schizophragma*  
            Buds with indistinct scales; scars horseshoe-shaped with 3 bundle traces . . . . . *Decumaria*

BB. Climbing by twining stems.  
E. Leaf scars opposite  
    Buds nearly concealed by the leaf base; sap milky . . *Periploca*  
    Buds evident  
        Stems warty; leaf scars low,  $\frac{1}{2}$ -round, and connected by hairy, transverse ridges, with 1 bundle trace . . . . . *Bignonia*  
        Stems smooth, hairy or glaucous; leaf scars small, crescent-shaped, on the narrowed ends of much-raised bases that are more or less connected by transverse lines, and with 1 bundle trace . . *Lonicera*

EE. Leaf scars alternate.  
F. Buds concealed.  
    Buds buried in the thickened cortex or swelling above the leaf scar . . . . . *Actinidia*  
    Buds covered by the leaf scars; fruit with a ringlike or crescent-shaped stone.  
        Fruit red, stone transversely ribbed, compressed . . *Cocculus*  
        Fruit black, stone curved & crested on back . . . *Menispermum*

FF. Buds evident  
    Buds superposed on a silky area in the arch of the U-shaped leaf scar . . . . . *Aristolochia*  
    Buds not as above  
        G. Buds with mucronate scales

FF. Buds evident.

Buds superposed on a silky area in the arch of the  
U-shaped leaf scar . . . . . Aristolochia

Buds not as above.

G. Buds with mucronate scales.

Buds small, low, stout, subglobose, held at a  
broad angle with the stem above the low leaf  
scars, the latter with one bundle trace . . Celastrus

Buds ovoid, with numerous scales, directed  
upward above the much raised leaf scars  
with 3-6 bundle traces in a broken ellipse. . Akebia

GG. Bud scales not mucronate.

Bark of twigs loose and shredding, not hairy; nodes  
very long; buds shrivelled and ragged with  
very loose scales . . . . . Polygonum

Bark firm, not loose nor shredding. . . . .

Buds narrowly oblong, acute at tip, and with  
a hornlike or wartlike prominence at each  
side of the base, giving them the appearance  
of insects when held upside down; twigs  
striped, not hairy, hard-wooded . . . . . Wisteria

Buds not as above, twigs soft-wooded.

Twigs hairy and striped; leaf scars compara-  
tively large, scarcely raised, with 2  
bundle traces and large stipule scars;

buds flattened, thin . . . . . Pueraria

Twigs not hairy; leaf scars much raised and  
with one bundle trace and no stipule scars.

Solanum

**ACTINIDIA ARGUTA** is recognized thus

SUMMER : a glabrous, unarmed twiner; leaves alternate, simple, petiolate, broad-ovate to elliptic, pinnately veined, serrate with bristle-tipped teeth; petioles red; flowers dioecious, in cymes or solitary, white, cup-shaped, with purple anthers; fruit a berry.

WINTER : stems orange-brown, glabrous, with a brownish, chambered pith; leaf-scars alternate, round, rather large, much raised, with one bundle trace and no stipule scars; buds tiny, green, embedded in the cortex or in a swelling above the leaf scar; end-bud lacking.

**AKEBIA QUINATA** is recognized thus

SUMMER : a twining vine, unarmed, glabrous; leaves alternate, palmately compound with five leaflets, long-petioled; leaflets oval to oblong, entire, petiolate, rounded, both ends or emarginate at the tip; flowers slender-stalked, fragrant, dark red-violet; fruit oblong, usually in pairs, seldom seen in cultivation.

WINTER : twigs slender, rounded, twining; leaf scars alternate, with 6 or more bundle traces in a broken ellipse, and no stipule scars, half-elliptic, much raised; buds evident, small, sessile, stout, ovoid, pointed, held at a broad angle to the stem, with 10-12 microneate scales, sometimes branching from the axils of the lower scales.

**ARISTOLOCHIA SIPHO** (syn. *durior*) is recognized thus

SUMMER : an unarmed twiner; stems greenish, glabrous, somewhat striate; leaves alternate, simple, entire, large kidney-shaped to ovate, thin, palmately veined; flowers pipe-shaped, greenish marked bronze; fruit a 6-ribbed capsule.

WINTER : unarmed stems terete, green, swollen at the nodes; leaf scars alternate, U-shaped, a little raised, with three bundle traces and no stipule scars; buds evident, superposed on a silvery area in the arch of the U-shaped scar, with few scales, silvery.

The Genus AMPЕLOPSIS is recognized thus (including *Parthenocissus*)

SUMMER : leaves long-petioled, palmately 3-5 parted or lobed, about as broad as long; stems round or slightly angled and with a firm bark; fruit a berry borne in cymes.

WINTER : woody climbers by means of tendrils or modified tendrils or aerial rootlets; stems round or slightly angled and with a firm bark; pith white or greenish; leaf scars half-round or nearly circular, with numerous bundle traces arranged in an ellipse; bark firm and close with prominent lenticels.

Summer and Winter Keys combined

Species	tendrils	leaves	cymes	young branchlets	leaflets	buds	fall color
<i>aconitifolia</i> without adhesive discs		5-parted	glabrous, fruit orange or yellow	lanceolate		small, with several outer scales	no change
<i>heterophylla</i>	"	simple, 3-lobed	on pilose stalks, vari-colored		broadly ovate	"	"
<i>quinquefolia</i> with 5-12 branches with adhesive discs, tendrils and internodes long		5-parted	crowded into round terminal panicles	green		rounded, not large; with 2-4 outer scales	vivid hues
<i>henryana</i>	"		"	"		"	"
<i>tricuspidata</i>	5-12 adhesive discs, tendrils and internodes short	3-lobed, simple or 2-leaved branchlets	on short 3-parted	square	with white markings, purplish below	"	"

N.B. varieties of *quinquefolia* and of *tricuspidata* are distinguished from the type by their foliage, viz. -

*quinquefolia engelmanni* -- leaves smaller and more dense.

*tricuspidata lowii* -- leaves small, much curled

*tricuspidata veitchii* -- leaves lobed, not divided.

ARISTOLOCHIA STPHO -- see preceding page.

The Genus **BIGNONIA** is recognized thus

Summer : a vine climbing by aerial rootlets; leaves opposite, pinnately compound; leaflets serrate, short-stalked, elliptic to ovate-oblong, acuminate, cuneate; flowers orange to scarlet, in terminal cymes or panicles, showy and conspicuous; corolla tubular-funnel form, with five rounded lobes; fruit a thick, almost bean-like pod which opens to disclose numerous winged seeds flattened about a central partition.

WINTER : a woody vine climbing by aerial rootlets; stems rounded, warty; leaf scars opposite, shield-shaped, low, with one C-shaped, compound bundle trace and no stipule scars but connected around the twig by hairy transverse ridges; buds rather small, usually solitary, sessile, triangular, compressed, ascending, with 2-3 pairs of outer scales.

Summer and Winter Keys combined

species	leaflets	mode of climbing	floral color	capsule	twig
radicans	pubescent beneath	by twining and by aerial rootlets	orange	apex beaked	puberulous
grandiflora	glabrous beneath	twining; has few or no aerial rootlets	scarlet	apex obtuse	glabrous

The Genus **CELASTRUS** is recognized thus

SUMMER : leaves alternate, petiolate, serrate, with small stipules; flowers in axillary cymes or terminal panicles, polygamomo dioecious, small, greenish, inconspicuous; fruit a yellow or orange capsule, dehiscent in 3 valves, disclosing a fleshy crimson aril.

WINTER : Twigs moderate, twining; pith white, relatively large; leaf scars alternate, half-elliptic, low, with one transverse bundle trace and with very minute stipule scars or sometimes with the stipules remaining as tufted hairs; buds small, sessile, solitary, subglobose, with about 6 hard, mucronate scales.

Summer and Winter Keys combined

species	flower and fruit clusters	leaves	fruit color	branches	scars
scandens	terminal	ovate	orange-red	lenticels scarcely noticeable	shield-shaped
orbiculatus	axillary	sub-orbicular, oblong or obovate	orange-yellow	lenticels very prominent	half-elliptical transversely

The Genus *CLEMATIS* is recognized thus

**SUMMER** : leaves opposite, usually compound, rarely simple; flowers apetalous, sepals petaloid, stamens numerous, carpels many, becoming one-seeded achenes with a persistent, plumose style.  
**WINTER** : soft-wooded climbers with much angled or ridged stems, the ridges being over the vascular bundles and having a cavity in the cortex under the ridges; pith angled, white; leaf petioles persistent, not disarticulating though dying, and prehensile (i.e. serving the function of climbing tendrils), without stipules or stipule scars; buds small, with 1-3 pairs of outer, rather hairy scales.

Summer and Winter Keys combined

Species	stems	stem color	flowers	twigs	sepals	leaflets
<i>Paniculata</i>	12-18 ridged	straw-colored	monoecious			entire, or occasionally lobed
<i>virginiana</i>	6 primary ridges stronger	brown	dioecious	finely pubescent		ovate, variously few-toothed or coarsely dentate
<i>Lawsoniana</i>	"	"	monoecious	"	"	ovate-lanceolate, acuminate, simple or with three leaflets
<i>henryi</i>	"	"	"	"	"	4-6, ovate or elliptic overlapping
<i>Jackmanni</i>	"	"	"	glabrate	"	4-6 obovate or pinnate

*COCCULUS CAROLINUS* is recognized thus

**SUMMER** : an unarmed climber with pubescent branchlets; leaves alternate, simple, palmately veined, entire or shallowly 3-5 lobed, orbicular to triangular-ovate, obtuse and mucronulate at the tip, rounded at the base, pubescent and glaucous beneath, glabrous above, rather long petioled; flowers dioecious, small, in short or sometimes spike-like panicles, with six petals and six stamens; fruit subglobose, red drupes with the stones curved, compressed, and transversely ridged.

**WINTER** : stems greenish to tan, twining, fluted, slender, terete; leaf scars alternate, elliptical, raised, concave, with 3-7 bundle traces and no stipule scars; buds small, hairy, superposed, the upper developing inflorescence, the lower covered by the leaf scars, with about three indistinct scales.

*DECUMARIA BARBARA* is recognized thus

**SUMMER** : a deciduous or sub-evergreen climber by aerial rootlets; bark peeling; leaves opposite, petiolate, ovate to elliptic, entire or sparsely toothed, acute, glabrous, estipulate, lustrous above; flowers in rounded, terminal corymbs, white, small; fruit an urn-shaped capsule, ribbed between the seeds.

**WINTER** : climbing by aerial rootlets; stems slender, round, exfoliating; pith greenish; leaf scars opposite, horseshoe-shaped, raised, concave, connected by a line around the twig, with three bundle traces and no stipule scars.

*COCCULUS* -- *CLEMATIS* -- *DECUMARIA*

The Genus *LONICERA* is recognized thus

SUMMER : twining, woody vines; leaves opposite, short-petioled or sessile, entire, sometimes connate, without stipules; flowers short-pedicelled in axillary pairs or in sessile terminal whorls; fruit a berry.

WINTER : woody vine which climbs by twining; subevergreen; twigs rounded, slender; leaf scars opposite, crescent-shaped, small, on the extremities of raised bases which are more or less connected by lines around the twig, with three bundle traces and no stipule scars; buds often superposed, the lowermost largest and developing inflorescence, sessile, with 2 to numerous 4-ranked scales.

Summer and Winter Keys combined

species	leaf color	leaves	flowers	fruits	stems
Japonica	deep rich green	oval	white to yellow	black	pubescent, grayish
sempervirens	blue-green, glaucous	ovate and connate	trumpet-shaped, red outside, yellow within	red	glabrous, yellowish

*MENISPERMUM CANADENSE* is recognized thus

SUMMER : a twiner with a persistent root and woody base but the upper growth less persistent; young growth pubescent; leaves orbicular, the petiole attached inside the margin, long-petioled, entire or shallowly 3-7 lobed, acute or obtuse, glabrescent; flowers small in loose panicles, not peduncled; fruit a subglobose drupe, blue-black, with a crescent-shaped stone crested on the back.

WINTER : semi-woody twiner; twigs round, fluted, slender, with a relatively large, white pith; leaf scars alternate, elliptical, concave on the face, and raised at the edges, with 3-7 bundle traces and no stipule scars; buds small, hairy, superposed, with the uppermost developing inflorescence and the lower covered by the leaf scar, with about 3 indistinct scales; fruit sometimes persisting, with a crescent-shaped stone crested on the back.

*PERILOCA GRAECA* may be recognized thus

SUMMER : a strong climber with glabrescent twigs; leaves opposite, ovate or elliptic to oblong-lanceolate, long acuminate, lustrous, entire; flowers in axillary or terminal cymes, greenish-yellow outside, purplish within; calyx glandular inside; fruit of two cylindric follicles cohering at the apex.

WINTER : a soft-wooded climber; sap milky; stems terete, twining; pith excavated; leaf scars opposite, raised, shrivelled or elliptical, with one crescent-shaped bundle trace and no stipule scars; buds small, solitary, almost concealed by the much raised leaf bases.

*LONICERA* -- *MENISPERMUM* --

*PERILOCA* --

**PARTHENOCISSUS** -- see *Ampelopsis*

The Genus **POLYGONUM** is distinguished thus

**SUMMER** : Leaves with tubular or sheath-like stipules, alternate, simple, ovate, entire, pinnately veined, lustrous, slender-petioled; flowers small, in racemes collected into small panicles, white or pinkish, showy because so profuse; fruit a small achene, triangular, enclosed by the persistent perianth.

**WINTER** : unarmed, twining woody climbers with jointed stems; bark loose and shredding; nodes very long; stems glabrous, green striped, slender, often dying back at the top; leaf scars alternate, crescent-shaped, narrow, with 3 bundle traces and narrow-linear stipule scars connected by a line around the twig; buds evident, shrivelled and ragged with thin, very loose scales; fruit more or less persistent, a small, triangular achene enclosed by 3 bracts and borne in racemes or panicles.

species	inflorescence	floral color	fruit
<i>auberti</i>	erect, minutely scabrous-pubescent	white	scarce or lacking
<i>baldschuanicum</i>	drooping, nearly glabrous	pinkish	profuse, large

**PUERARIA THUNBERGLIANA** is recognized thus

**SUMMER** : a twining, high-climbing, unarmed vine of very rapid growth; root a fleshy tuber; leaves alternate, pinnately compound, 3-parted, stipulate; leaflets large, often lobed, stipellate, margin entire, hairy; flowers blue-violet, pea-like, in long dense, axillary racemes; bracts and bractlets small, soon dropping; fruit an elongated, 2-valved, bean-like pod.

**WINTER** : bark firm, branchlets striped, soft-wooded, hairy, dying back to the base in winter, inter-

nodes long; root persistent, fleshy, tuberous; leaf scars alternate, scarcely raised, compar-

atively large, with 2 bundle traces and large stipule scars; buds flattened, thin, scales

**SCHIZOPHRAGMIA HYDRANGEOIDES** is recognized thus

**SUMMER** : a vine climbing by aerial rootlets; bark of the older branches with longitudinal fissures; leaves opposite, long-petioled, broadly ovate, sparsely and coarsely dentate, short-acuminate, cordate, nearly glabrous, estipulate; flowers small, whitish, in loose, peduncled corymbs margined with sterile flowers having a single large white sepal; fruit a conical, ribbed capsule containing many seeds.

**WINTER** : stems brown, rather slender; bark finally splitting longitudinally and peeling; leaf scars smallish, developing into short spurs, solitary, with 2-4 outer scales which are golden-brown, pubescent, and inclined to be ciliate; end-bud somewhat enlarged.

**PARTHENOCISSUS** -- **PUERARIA**

**SCHIZOPHRAGMIA**

The Genus SMILAX is recognized thus

**SUMMER** : woody climbers with paired tendrils on the base of the petiole; those on the list given below all having distinct but narrow stipules with tendrils; stems often prickly, little branched at the base; lower leaves much reduced, upper leaves entire or sometimes slightly 3-lobed, with parallel veination; flowers dioecious, small, inconspicuous, in axillary umbels; fruit a small, black berry with 1-to several seeds.

**WINTER** : a vine climbing by tendrils, armed with straight, often strong prickles; stems terete or angular, the woody fibers embedded in the pithy stalk as in a cornstalk i.e. endogenous; leaves tearing away above the clasping base, thus leaving no definite scar but carrying 10-12 vascular bundles, the stipules or their equivalent persisting as tendrils on these leaf bases; buds triangular, pointed, widely divergent, with one bud-scale, enclosed in the remnant of the leaf base.

Summer Key

species	leaves	fruits	peduncles	fruit seeds
glauca	very glaucous below	bloomy	much longer than petioles	3-seeded
hispida	glabrous or glabrescent	not bloomy	"	1-seeded
rotundifolia	"	not bloomy, lustrous	shorter than petioles	3-seeded

Winter Key

species	stems	stem color	prickles
glauca	glaucous	brownish	few
hispida	not glaucous	green	stout, flattened at base, dense below
rotundifolia	not glaucous	green	needle-like, black, few

**SOLANUM DULCIMARA** is recognized thus

**SUMMER** : a scrambling shrub; branches sometimes spiny; leaves alternate, simple or compound, ovate to ovate-oblong, entire, lobed at the base, acuminate, cordate, puberulent, petiole short to moderate; flowers in cymes, rarely solitary, shallow-bell-shaped, with connivent anthers like a potato blossom; fruit an ovoid, scarlet berry in drooping clusters. Fruits are said to be poisonous.

**WINTER** : a soft-wooded scrambler, slightly inclined to twine; stems slender, somewhat angular or terete, pith large, greenish, spongy; leaf scars alternate,  $\frac{1}{2}$ -round, much raised, with one rather large bundle trace and no stipule scars; buds subglobose, small, solitary, sessile, with 4 hairy, obtuse outer scales; vestiges of fruit clusters often remaining, opposite the leaf scars or beside the axils.

SMILAX -- SOLANUM

The Genus **VITIS** is recognized thus

**SUMMER** : Woody vines climbing by means of tendrils; pith brown, usually interrupted at the nodes by diaphragms; leaves alternate, simple, coarsely dentate, usually lobed; flowers in panicles opposite the leaves; fruit a pulpy 2-4 seeded berry borne in dense panicles.

**Summer Key**

species	basal sinus of leaves	under side of leaves	leaf form	tomentum	tendrils	branchlets
cordifolia	narrow; leaves ovate, undivided or slightly 3-lobed	green and Glabrous or slightly pubescent				terete, glabrous
vulpina	wide; leaves broader	"				
aestivalis	lobes often overlapping	—	—	deeply lobed with round sinuses	—	intermittent**
coignetae	indistinct	"	—	not or indistinctly lobed	brownish floccose	terete
cineræa	open, wide	"	—	"	"	"
labrusca	open	densely and persistently brown tomentose	slightly 3-lobed	grayish floccose	"	distinctly angled
				brown, dense continuous***	terete	—

\* with bunches of soft hair or wool  
\*\* often skipping a node  
\*\*\* one at each node

**VITIS** -- **Summer Key**

The Genus *VITIS* is recognized thus

**WINTER** : woody climbers with forked tendrils opposite the leaf scars; bark shredding in long strips, without lenticels; pith brown; twigs striate or angled; leaf scars alternate, 2-ranked, half-round or crescent-shaped, with several bundle traces arranged in a C and with long, narrow stipule scars; buds subglobose, with two broad scales, laterally branching; end-bud lacking.

Winter Key

species	twig bark	twigs	tendrils	nodal diaphragms	fruit panicles
<i>cinernea</i>	gray woolly	distinctly angled	intermittent		
<i>coignettiae</i>	brown woolly	distinctly angled	intermittent		
<i>laurusca</i>		nearly terete	continuous *		
<i>vulpina</i>	"		intermittent **	thin	
<i>cordifolia</i>	"		"	thick	vestiges open and large
<i>aestivalis</i>	brown floccose	"	"	"	vestiges compactly branched

\* one at each node

\*\* often skipping a node

The Genus *WISTERIA* is recognized thus

**SUMMER** : woody twiners; leaves pinnately compound, with 9-19 leaflets with stipules soon falling, alternate; leaflets shortly petioled, alternate, stipellate; flowers light purplish or white, pea-like, in long racemes, the flowers opening from base to apex gradually; fruit an elongated bean-like pod, somewhat contracted at intervals.

**WINTER** : woody vines which climb by twining; stems moderate, slightly fluted; leaf scars alternate, transversely elliptical, much raised, and with a horn- or wart-like protuberance on each side at the base, so that bud and scar together have the appearance of an insect when viewed upside down, with one bundle trace and no stipule scars; buds medium to medium-large, solitary, sessile, narrowly oblong and acute at the tip and nearly surrounded by the outer scale.

#### Summer and Winter Keys combined

N.B. Wisteria species are difficult to distinguish in winter, but possible if one have fruits as well as twigs.

species	leaflets	branchlets	fruit pods	flower clusters
<i>Floribunda</i>	13-19	slightly pubescent	velvety, 10-15 cm. long, narrowed near the base	very long
<i>frutescens</i>	usually fewer, 9-13	glabrous or nearly so	glabrous, 5-10 cm. long, compressed	racemes 4-5" or less in length
<i>sinensis</i>	"	pubescent	10-15 cm. long, densely velutinous, 1-3 seeded	racemes 6-12" or more in length

## KEY TO THE HARDY BROAD-LEAVED EVERGREENS

A. Climbing by aerial rootlets.

Branchlets terete; leaves alternate, lobed or broadly ovate, margin entire . . . . . Hedera  
Branchlets square or 4-angled; leaves opposite, ovate to obovate or narrow-elliptic, margin toothed . . . . . Euonymus

AA Not climbing.

B. Leaves whorled.

Leaves small, linear, revolute, regularly whorled . . . . . Erica  
Leaves larger, oblong-obovate, serrate, in irregular whorls . . . . . Chimaphila

BB. Leaves opposite.

Leaves scalelike, 4-ranked, keeled, auricled at the base; corolla 4-parted, persistent; flowers in terminal spikes . . . . . Calluna

Leaves ordinary, not scalelike.

C. Leaf margin entire.

Habit prostrate . . . . . Vinca  
Habit erect.

D. Branchlets square; leaves ovate to oblong; buds with several scales . . . . . Buxus

DD. Branchlets terete; leaves oblong to elliptic, revolute, not dotted; buds with two outer scales . . . . . Kalmia

CC. Leaf margin serrate or serrulate.

Branchlets square or 4-angled.

With very small linear or narrow-oblong leaves, somewhat revolute and finely serrate above the middle . . . . . Pachistema  
With broader, lustrous leaves, ovate to obovate or narrow-elliptic . . . . . Euonymus

Branches terete and tomentose; leaves large and strongly wrinkled, and tomentose beneath . . . . . Viburnum  
(see shrub keys )

BBB. Leaves alternate.

E. Leaves pinnately compound.

Prostrate half-evergreen, armed with strong prickles . . . Rosa  
Erect, evergreen, unarmed; leaves spinose-dentate . . . Mahonia

EE. Leaves simple.

Leaf margins sinuately spiny; some leaves 3-foliate . . . Berberis  
Leaves not as above.

A low plant with obovate leaves 3-nerved at the base and dentate . . . . . Pachysandra

Leaves not obovate or not 3-nerved at the base.  
Branches thorny . . . . . Pyracantha  
Branches not thorny.

F. Habit prostrate, creeping or trailing.

Leaves and stems bristly with rusty hairs;  
leaves oval, rounded or heart-shaped;  
flowers salverform in terminal clusters,  
very fragrant . . . . . Epigaea

Not as above

Stems creeping on or below the surface  
sending up sparse erect branches  
with a few leaves at the tip; leaves  
glossy dark green, obscurely serrate  
and with a spicy-aromatic flavor . . Gaultheria

Stems trailing; leaves with margin entire  
and without the spicy-aromatic flavor.

Leaves narrow, oblanceolate, glaucous  
beneath, with a sharp-pointed tip;  
branches pubescent . . . . . Daphne

Leaves broader, obovate-oblong, thick,  
with finely impressed veins, wedge-

shaped at the base, and with  
the tip obtuse or retuse; bark  
exfoliating . . . . . *Arctostaphylos*

FF. Habit erect.  
Leaves fragrant when crushed, slightly  
rugose above, and densely brown-  
tomentose beneath, tip very obtuse . *Ledum*  
Not as above.  
G. Leaves toothed on the margin.  
Leaf margins with spiny teeth . . . . *Ilex*  
Marginal teeth not spiny, margins  
serrulate or obscurely toothed.  
Leaves glandular black-dotted beneath . . .  
Not glandular beneath. *Pieris*  
Leaves covered with scurfy scales  
beneath; margin obscurely  
denticulate . . . . . *Chamaedaphne*  
Leaves not scurfy-scaly beneath,  
conspicuously petiolate, broadly  
lanceolate, acuminate; marginal  
teeth bristle-tipped . . . *Leucothoe*

GG. Margins entire.  
Leaves linear and revolute . . . . *Andromeda*  
Leaves not linear.  
H. Leaves lighter beneath.  
Under side yellowish; leaves  
cuneate and revolute . . . *Kalmia*  
Under side whitish; leaves ellip-  
tic to oblong.  
Evergreen . . . . . *Rhododendron*  
Deciduous . . . . . *Azalea*

HH. Leaves green beneath or hairy,  
rounded or oval . . . . . *Cotoneaster*  
(see deciduous shrubs)

The Genus AZALEA is recognized thus  
SUMMER : upright shrubs; leaves alternate, short-petioled, entire or ciliate; flowers from leafless  
terminal or lateral buds; lateral buds clustered at the ends of branchlets; corolla funnel-  
form; stamens 5-10, more or less exerted; fruit a capsule.

species	flowering season	foliage	young bark	branchlets	under side of leaves	corolla tube	twigs	corolla	shape of leaves	upper side of leaves
amoena	before the sub-evergreen leaves		with flat chaff-like scales rather than hairs			shorter than the lobes			obtuse	
mucronulatum	"	"	"	glabrate	pale with scattered glands		glabrate	puberulous	broadest near base acute	
kaempferi	"	deciduous, thin	"							
japonicum	"	"	not chaffy-scaled, but pubescent or glandular	glabrous	bristly on veins	"				
(canescens) roseum	"	"	"	finely pubescent	gray-pubescent	"				
nudiflorum	"	"	"	pubescent	glabrous as long as or longer than the midribs					
vaseyi	"	"	"	puberulous	"	shorter than the lobes				
arboreo with or cens after the leaves	"	"	"	glabrous	as long as or longer than the lobes	glabrous	white	broadest near tip	gla-Brous	
viscosum	"	"	"	with stiff appressed hairs	hairy appressed bristles on midrib	"	hairy and sticky	viscid & glandular	"	"
calendulaceum	"	"	"	pubescent	"	pubescent	fiery red	"	finely pubescent	
canadense *	"	"	"	puberulous, hairy, sparsely glandular on midrib or glaucous	shorter than the lobes	puberulous	rose purple	broadest at middle	slightly pubescent	

\**Rhododora canadense*  
Although deciduous, Azalea is placed in this section because of its very close relation to Rhododendron  
AZALEA -- Summer Key

THE HARDY AZALEAS are recognized thus

erect shrubs with deciduous leaves; twigs moderate, terete; pith rather small, slightly colored, continuous; buds solitary, sessile, clustered above thus causing the branches to cluster near the end of the season's growth; upper buds enlarged, ovoid, with about 6 ciliate scales; flower buds still larger; lower buds increasingly smaller and with fewer scales; leaf scars alternate, low, shield-shaped, notched or straight at the top, with one bundle trace and no stipule scars; fruit often persistent, oblong, 5-valved capsules.

11.B. See key to *Rhododendron*

species	foliage	twigs	leaf scars	pedicels	flower buds	branchlets	buds	capsules	bud color
amoena ( <i>Octosma</i> )	sub-evergreen	With flat, chaff-like scales rather than hair							
kaempferi	deciduous, thin	"							
mucronulatum	"	"	low	scaly					
vaseyi	"	not chaffy-scaly but pubescent or glandular	raised scarcely notched						
japonicum	"	"	not raised	tomentulose & glandular					
canadense	"	"	"	sparsely long-hairy	of a few which drop early				
roseum	"	"	"	glandular	of numerous much-imbricated scales	puberulous	puberulous		
arbor-escens	"	"	"	glandular	or villous-pubescent				
viscosum	"	"	"	glandular	entirely	glabrous	glabrous		
nudiflorum	"	"	"	bristly	"	glabrate or glandular	puberulous		
calendulaceum	"	"	"	"	"	"	With spreading glands	rosy	
				sparsely long-hairy	"	glabrous	ascendings hairs	brown	
					"	glabrous, not glandular		brown	

The Genus *BUXUS* is recognized thus  
evergreen shrubs or small trees; twigs slender, green, flat-grooved between each pair of leaves;  
leaves opposite, small, leathery, almost elliptical, entire, short-petioled, glabrous, with one  
main vein; buds sessile, solitary, small, ovoid, with 2-4 scales; flower-buds larger and multiple;  
leaf scars minute, raised, crescent-shaped, with one bundle trace and no stipule scars; flowers small,  
inconspicuous, in axillary or terminal clusters; fruit an ovoid, 3-horned capsule with two lustrous  
black seeds.

species	variety	leaves	branchlets	flowers	habit
<i>sempervirens</i>		elliptic to lance-oblong; broadest at or below the middle	usually a little pubescent	axillary clusters	
<i>myrtifolia</i>		small, elliptic-oblong			low
<i>microphylla</i>		obovate to oblong-obovate broadest above the middle	usually glabrous	mostly terminal	
<i>koreana</i>		obovate, emarginate, pubescent on the midrib above	softly pilose	axillary and terminal	

*CALLUNA VULGARIS* is recognized thus  
a small evergreen shrub; leaves opposite, scalelike, 4-ranked, keeled, sessile, auricled at the base;  
oblong-ovate, puberulous or nearly glabrous; flowers pink in dense racemes or terminal spikes, corolla  
4-parted, persistent; fruit a 4-valved capsule; twigs very slender, rounded; buds solitary, sessile,  
small, globose and angular, with about 3 outer scales.

*CHAMAEDAPHNE CALYCULATA* is recognized thus  
A low erect shrub with numerous spreading branches, bushy and unarmed; leaves alternate, simple, obo-  
vate to oblong, scurfy, short-petioled, revolute, obscurely toothed or nearly entire, with one main  
vein; flowers white, short-pedicelled, in terminal, nodding, leafy racemes on the under side of the  
branches; fruit a dehiscent capsule; twigs slender, with a shredding gray bark, finally smooth, red-  
brown.

*CHIMAPHILA UMBELLATA* is recognized thus  
a small, low-growing, half-shrubby or herbaceous plant with long, running underground stems sending  
up leafy shoots tufted with leaves at the top; leaves whorled, moderate size, oblong-ovate, serrate,  
short-petioled, thick and shining; flowers in nodding, terminal, stalked clusters, white or reddish,  
fruit a globose capsule.

The Genus DAPHNE is recognized thus

Evergreen or deciduous shrubs; winter buds with several outer scales; leaves alternate, rarely opposite, short-petioled, entire, narrow, oblanceolate, with one main vein, acute, glaucous-beneath; flowers perfect, petalous, in terminal or axillary short racemes or umbels, usually with bracts; calyx tube campanulate to cylindric, usually 4-lobed, corolla-like, usually pubescent on the outside; stamens 6-10 in two rows, included; stigma capitate, sessile, or on a short style; ovary without disk at the base, or a ringlike disk, or a ringlike disk, or one entire scale; fruit a leathery or fleshy one-seeded drupe.

species	leaves	corolla	habit	flowers
mezereum	deciduous, glabrous	alternately pubescent	erect to 3' or 4'	axillary along old wood
cneorum	evergreen	densely pubescent outside	low or procumbent 1' to 1½'	in terminal heads

EPIGAEA REPENS is recognized thus

a prostrate plant, carpeting the ground; leaves and stems bristly with rusty hairs; twigs slender; petioled; leaves alternate, simple, oval to elliptical-ovate, with one main vein, entire and ciliate, short-globular, splitting into a 5-parted rosette with a fleshy, berry-like interior.

DAPHNE ---  
EPIGAEA

The Genus *ERICA* is recognized thus  
a low, spreading shrub, often forming matlike growths; leaves small, linear, revolute, petiolate, regularly whorled, mostly longer than the internodes of the very slender stems; flowers pink or white, in terminal spikes or panicles; fruit a 4-valved capsule, ovoid or subglobose, enclosed in the persistent corolla.

species	anthers	leaves and calyx tubes	branchlets	inflorescence	location of anthers	sepals	sepals form	leaves
<i>tetralix</i>	appendaged	conspicuously ciliate	minutely villosular hirsute	terminal umbel-like				
<i>ciliaris</i>	not appendaged	"	densely pubescent	terminal spikes				
<i>cineraria</i>	appendaged	glabrous	finely pubescent	terminal racemes or panicles				
<i>scoparius</i>	not appendaged	"	glabrous	axillary, cylindric spikes	included in corolla tube			
<i>vagans</i>	"	"	"	lateral	exserted	less than $\frac{1}{2}$ ovate as long as the corolla		
<i>carnea</i>	"	"	"	axillary, forming terminal racemes	"	more than $\frac{1}{2}$ long as corolla	lanceolate	

*GAULTHIERIA PROCUMBENS* is recognized thus  
a low, tufted, spreading plant with a procumbent stem, spreading by creeping roots; leaves alternate, simple, oval, entire, with a spicy-aromatic flavor, glossy deep green, with one main vein, obscurely serrate, glabrous, short-petioled; flowers axillary, urn-shaped, nodding, pinkish-white; fruit a bright red, spicy-flavored berry, nearly globular, slightly 5-lobed at the top.

*HEDERA HELIX* is recognized thus  
a vine creeping or climbing by small rootlets at the nodes; branchlets terete, nodes long; leaves alternate, lobed or broadly ovate, margin entire; flowers in globose umbels terminal on high-climbing branches, inconspicuous; fruit a 3-5 seeded drupe, black, and berrylike, not formed in northern states.

The Genus *ILEX* is recognized thus

evergreen or deciduous shrubs or trees; leaves alternate, simple, moderate in size, estipular, odorless, often spiny-toothed; twigs smooth dark gray marked lighter gray, lenticular, somewhat angular, often spurlike, with crowded leaf scars; buds small, sessile, broadly ovoid, usually superposed, with 2-6 outer scales; flowers solitary and axillary or fascicled in cymes, 4-merous; fruit a small drupe with several bony nutlets; leaf scars crescent-shaped, raised, clustered near ends of twigs but with longer internodes on older growth, with one bundle trace and minute stipule scars or persistent stipules.

species	leaves	flowers and fruits	fruit color	leaf margin	flowers	leaf apex
<i>Verticillata</i>	deciduous					
<i>aquifolium</i>	evergreen	axillary on last year's branchlets, usually clustered		spiny with large triangular teeth		
<i>opaca</i>	"	solitary or in clusters axillary on young branchlets	red	coarsely spiny-toothed		
<i>Elabrum</i>	"	"	black	With few obtuse teeth near apex or entire	5-8-merous	obtuse
<i>crenata</i>	"	"	"	serrate or crenate, only a few teeth near the apex	4-merous	sharp-pointed

The Genus *KALMIA* is distinguished thus

evergreen undershrubs, poisonous in all parts; twigs moderate, gray; leaf scars clustered on new growth but with longer internodes on older wood, shield-shaped, with a linear bundle trace and no stipule scars; buds with two outer scales; leaves alternate, opposite or whorled, peltate, saucer-shaped with ten small pouches which hold the anthers bent over into them, the latter springing up suddenly to discharge pollen when touched; fruit a 5-valved dehiscent capsule containing numerous minute seeds.

species	arrangement	leaf tip	leaves	inflorescence	pod	flowers
<i>latifolia</i>	mostly alternate	acute	distinctly peltate	compound (corymbs)	depressed glandular	terminal
<i>angustifolia</i>	opposite or in 3's	obtuse	short-peltate	compound	depressed, nearly smooth	lateral
<i>polifolia</i>	"	"	sessile or nearly so	simple umbels	ovoid smooth	terminal

*LEDUM GROENLANDICUM* is recognized thus  
a dwarf evergreen shrub twigs rusty-tomentose, slightly triangular; leaves alternate, simple, oblong  
entire, revolute, fragrant when crushed, slightly rugose above, densely brown tomentose beneath;  
leaf scars minute, slightly raised, triangular, with one bundle trace and no stipule scars; buds small,  
solitary, sessile, conical or globose, with 2-3 outer scales; flowers white in largish terminal umbel-  
like clusters, showy, puberulous; fruit an oblong capsule, more or less persistent.

*LEUCOTHOE CATESBAEI* is recognized thus

An arching under-shrub; twigs reddish and puberulous when young; leaves alternate, simple, lanceolate,  
lustrous, leathery, slightly spinulose-toothed, short-petioled, lighter on the under side, acuminate;  
leaf scars small, crescent-shaped, scarcely raised, with one bundle trace and no stipule scars; buds  
small, globose, solitary, sessile, with 3-4 outer scales; end-bud lacking; flowers white, rarely pink,  
in sprays or loose axillary racemes drooping below the branches, very fragrant; fruit a subglobose  
5-lobed capsule, often persistent.

*MAHONIA AQUIFOLIUM* is recognized thus  
an erect unarmed shrub; twigs smooth, slightly glaucous, rather stout; leaves alternate, pinnately  
compound, spinose-dentate; leaflets 5-9, ovate to oblong-cvate, stiff and leathery; leaf scars narrow,  
low, half-encircling the twig, with numerous bundle traces and no stipule scars; buds smallish with  
about 6 outer scales; terminal bud enlarged; flowers yellow racemose, in showy terminal masses; fruit  
a small, glaucous, blue berry.

LEDUM -- LEUCOTHOE -- MAHONIA

**PACHISTIMA CANBYI** is recognized thus  
a low shrub; twigs square or 4-angled, inclined to be warty; bark becoming rather corky and checked;  
leaves opposite, small, linear or narrow-oblong, somewhat revolute, serrulate above the middle,  
short-petioled; leaf scars minute, crescent-shaped, slightly raised, with one indistinct bundle trace,  
and no stipule scars; buds solitary, sessile, ovoid, appressed, very small, with 2 outer scales;  
flowers small, axillary, 4-merous, in few-flowered cymes; fruit a 2-valved capsule.

**PACHYSANDRA TERMINALIS** is recognized thus  
evergreen, procumbent plants with fleshy stems and matted creeping rootstalks; glabrous; leaves tufted  
at the top of the short stems, alternate, simple, obovate, coarsely dentate, acute, cuneate, 2-nerved  
at the base; flowers tiny, whitish, in inconspicuous terminal spikes; fruit a 3-horned whitish drupe.

**PYRACANTHA COCCINEA** is recognized thus  
a low, horizontally spreading shrub of very irregular outline, armed with slender, spreading, purple  
spines; buds small, sessile, solitary or laterally branched in spine formation, broadly ovoid,  
pubescent, with about 6 outer pointed scales; leaves alternate, simple, narrow-elliptic to lanceolate  
to oblanceolate, acute, cuneate, toothed or entire, short-petioled, glabrous; leaf scars crescent-  
shaped or 3-lobed, with three bundle traces and minute stipule scars; flowers white in compound corymbs;  
fruit a small pome with a persistent calyx, subglobose, orange-red.

The variety **LALANDI** is more vigorous in growth, has more slender branches, the leaves more deeply notched,  
and the orange-red fruits more profusely produced.

The variety **ROYALI** is almost identical with **lalandi** except in hardiness. It is said to withstand a temper-  
ature twenty degrees below zero.

PACHISTIMA -- PACHYSANDRA -- PYRACANTHA

The Genus PIERIS is recognized thus

twigs rather slender, 3-sided becoming terete; leaves alternate, simple, short-petioled, entire and revolute or serrulate; leaf scars small, half-round or triangular, somewhat raised, with one bundle trace and no stipule scars; buds small, ovoid to conical, with 2-5 outer scales; end-bud lacking; flowers in terminal panicles, 5-merous; fruit a small, globose or urn-shaped dehiscent capsule.

species	branchlets	flower-clusters	inflorescence
floribunda	bristly-hairy	upright	terminal panicles
japonica	glabrous	drooping	terminal panicles
mariana *	glabrous	nodding	axillary fascicles forming terminal leafless racemes (racemose fascicles)

\* syn. *Lyonia mariana*

The Genus RHODODENDRON is recognized thus  
shrubs, rarely trees; buds with overlapping scales; leaves evergreen, alternate, large, petiolate,  
entire; flowers colorful, in terminal, umbel-like clusters or racemes, sometimes solitary  
or few, rarely from lateral buds, pedicelled; calyx usually 5-parted; corolla a little  
irregular, 5-parted or more; stamens 5-10, anthers opening at the tip; capsule ovoid to oblong,  
opening between the cells; seeds minute, numerous.

Rhododendrons are so numerously hybridized as to be embarrassing to the student. To give a record that would  
be anywhere near complete is manifestly impossible in the scope of this key, nor we do consider it  
desirable at this time. Only the more important hardy native species available for landscape use are here  
given.

As distinguished from Azaleas, the Rhododendrons have leathery, persistent leaves, 10 stamens rarely  
projecting beyond the corolla; leaves alternate, simple, entire; plant unarmed.

RHODODENDRON -- leaves evergreen, leathery, persistent; corolla campanulate; stamens and style rarely exerted,  
AZALEA . . . . . leaves deciduous, glandular mucronate; corolla funneliform; stamens and style more or less  
exerted.

species	foliage	leaf tip	pedicels	leaves
maximum	evergreen	acute	viscid	acute, 4-10" long, thinly scurfy-tomentose, rarely glabrous
catambeense	evergreen	rounded	rusty-downy	obtuse or obtusish, 3-5" long, glabrous, pale on the under side

VINCA MINOR is distinguished thus  
an evergreen, trailing subshrub, rooting at the nodes; leaves opposite, 4-ranked, ovate, lobed on the  
immature growth, entire, stipulate, dark green, the veins whitening effectively in winter; flowers  
violet-blue, the corolla salverform; stamens fastened to the middle of the corolla tube; fruit of  
two dehiscent, cylindric follicles.

## CONIFER GENERA

Genus	character	leaf arrangement	leaves	leaf blade	leaf base	branchlets	winter buds	fruits
<i>Taxodium</i> Bald Cypress	deciduous	spreading in 2 ranks or rows						
<i>Larix</i> Tamarack or Larch	"	clustered on short spurs						
<i>Cedrus</i> Cedar	evergreen	clustered on spurs or alternate	fascicled in a membranous sheath	4-sided or 4-grooved	terete			
<i>Pinus</i> Pine	"	not clustered on spurs	not fascicled, scattered	4-sided, sessile	persistent, not recurrent			
<i>Picea</i> Spruce	"	"	not fascicled, stiff	4-sided, sessile	flattened, recurrent			
<i>Taxus</i> Yew	"	"	not fascicled, appearing 2-ranked by twist in stalk	flattened, not petiolate	stomata on upper side			
<i>Tsuga</i> Hemlock	"	"	appearing 2-ranked, not soft	flattened, petiolate, recurrent	stomata above	with prominent yellowish leaf cushions	yellowish or blackish	
<i>Pseudotsuga</i> Douglas Fir	"	"	appearing 2-ranked, soft & flexible	"	"	smooth, with oval leaf scars	not resinous	
<i>Abies</i> Fir	"	"	"	flattened, sessile, stomata above	"	smooth, with pointed, not resinous	obtuse, resinous	
<i>Sciadopitys</i> Umbrella Pine	"	whorled at end of branches	deeply grooved both sides					
<i>Chamaecyparis</i> Retinopora	"	opposite or whorled, in 4 rows	usually scale-like	with white markings on under side	a little flat, compressed	with 2-3 seeds under each cone scale	not as above	
<i>Thuja</i> Arborvitae	"	"	"	as above & glandular	very flat, in one plane	with 4 or more seeds to each cone scale	with 4 or more seeds to each cone scale	
<i>Cupressus</i> Cypress	"	"	usually scale-like and minutely toothed	with white markings on under side	round or square			
<i>Juniperus</i> Juniper	"	"	awl-like or scalelike	with white markings on upper surface	round or square	round or square	a berry	

**The Genus *ABIES* is distinguished thus**

Leaves scattered, sessile, linear, flat and grooved or quadangular, and appearing 2-ranked; leaf base not persistent; winter buds obtuse and resinous.

species	leaves	color	branchlets	buds	cone bracts	bark	resin ducts
homolepis	pointed and rigid	lustrous, green	grayish, glabrous, deeply grooved				internal
veitchii	"	"	not grooved, densely brown pubescent				scaly
concolor	blunt	glaucous or pale blue	pubescent, yellow-green				marginal
fraseri	"	lustrous, green	red, densely pubescent	small, very resinous	exserted		
balsamea	"	"	ashy-gray, pubescent	"	not exerted, reflexed		
cilicica	"	"	"	"	hidden		
nordmanniana	"	"	"	"	exserted and reflexed		

N.B. - All *ABIES* on this list are without bands of stomata on the upper side of the leaves, and have sub-globose winter buds with imbricate scales.

**ABIES**

The Genus *CEDRUS* may be recognized thus  
Leaves alternate or clustered on short spurs; in fascicles of 2-5 surrounded at the base by a sheath  
of scarious scales; needle-leaves angled or quadrangular in section.

species	leading shoot and branchlets	cones	branchlets
<i>deodara</i>	pendulous	rounded at apex	pubescent, densely so
<i>atlantica</i>	upright or nodding	apex truncate or concave	densely short-pubescent
<i>libani</i>	"	"	glabrous or scarcely pubescent

The Genus *CHAMAECYPARIS* is recognized thus  
leaves opposite or whorled, usually scale-like and minutely denticulate; cones maturing the second  
year, with four or more seeds to each bract; branchlets a little flattened or angular (nearly  
square); internodes about square, glandular.

species	branchlets	under side of leaves	glands	relative size of leaves	leaf tip	stamine flowers	foliage color
<i>nootkatensis</i>	nearly quadrangular	without white markings	usually lacking	lateral and facial equal			
<i>pisifera</i>	flattened	with white markings	obscure	"			
<i>thyoides</i>	"	"	conspicuous on back of leaves	"			
<i>obtusa</i>	"	"	not glandular	lateral ones larger	obtuse	yellow	lustrous dark green
<i>lawsoniana</i>	"	" (but sometimes indistinct)	conspicuous on back of leaves	"	acutish	red	bright green or more or less glaucous

**CRYPTOMERIA JAPONICA** is recognized thus

a pyramidal tree with spreading and upcurving branches; bark red-brown, peeling in long strips much like a Cedar or a Cypress; buds minute; leaves linear-awl-shaped, flattened laterally, keeled both faces, bright green, decurrent, directed forward and curved in, in 5 ranks; flowers monoeious, staminate cones in terminal racemes, pistillate cones solitary and globose at the ends of short lateral branchlets, brown, ripening the first year, persistent; cone-scales wedge-shaped.

The Genus **CUPRESSUS** is recognized thus  
foliage fragrant; bark shredding; branchlets quadrangular or terete; leaves opposite, small, scale-like, appressed; cones globular, each cone-scale with numerous seeds.

species	branches	lower bark	leaves
<i>semperfiriens</i>	erect or horizontal	thin, gray, smooth or slightly longitudinally fissured	ovate, glandular
<i>macrocarpa</i>	horizontal	ridged, dark reddish-brown, separating into thick, persistent scales	rhombic-ovate, not or obscurely glandular, swollen toward tip

The Genus JUNIPERUS is recognized thus  
leaves opposite or whorled, alternating in pairs at right angles, linear or scale-like, often both  
kinds on the same plant, acute, with 2 glaucous or whitish lines on the upper side and green  
beneath; fruit berry-like.

species	leaves	glands	upper side of leaves	leaf base	staminate flowers	branch-leaf lets	leaf tip	fruit	form	habit	color
communis	always needle- shaped & in 3's	absent	with one white line	jointed	axillary			dark blue			
macrocarpa	"	"	With two white lines	"	"			dark brown. [glaucous] 1-seeded]			
squamata	"	"	"	decurrent	terminal	green	"	dark brown			
chinensis	of 2 kinds; opposite or in 3's	present	"	"	"	scale- like, leaves obtuse	2-3 seeded	brown, bloomy			
excelsa	"	"	"	"	"	acute	3-6 seeded	brown, bloomy, or erect			
virginiana	"	"	"	"	"	acute or acuminate	upright tree	upright tree			
horizontalis	"	"	"	"	"	green	"	blue, bloomy, pendu- lous	shrub	pro- strate	blue- green
sabina	"	"	"	"	"	obtusish	"	"	ascend- ing or spreading	dark green	—

The Genus *LARIX* is recognized thus

tree with one main trunk through to the top, bark scaly; needle-leaves soft, deciduous, clustered on short spurs; fruit an ellipsoid cone with thinnish scales.  
WINTER: branches often drooping; branchlets with short lateral spurs on which are found the leaf scars; leaf scars alternate, raised,  $\frac{1}{2}$ -round or triangular, minute, clustered on the short lateral spurs, with one bundle trace and no stipule scars; buds solitary, sessile, small, globose or short-ovoid, with many brown scales which are sometimes slender-pointed.

Summer and Winter Keys combined

species	bracts	under side of leaves	cones	cone scales	branchlets
<i>occidentalis</i>	exceeding scales of cone				
<i>leptolepis</i>	shorter than scales	with two white bands			
<i>europaea</i>	"	without conspicuous white bands	erect	not incurved at apex, pubescent on back	glabrous
<i>laricina</i>	"	"		pendant	glabrous, striate, lustrous
<i>dahurica</i> syn. <i>Gmelini</i>	"	"		"	pubescent

The Genus *LARIX* is recognized thus

Aromatic trees with the branchlets densely clothed with small, appressed, scale-like leaves; leaves  $\frac{1}{4}$ -angled or terete, rarely flattened, opposite, minutely denticulate and ciliate, possibly awl-shaped and spreading on very young plants; cones globose or nearly so, ripening the 2nd season, with up to 12 woody, shield-shaped scales, each scale with numerous flattish, narrowly winged seeds.

*LARIX* -- *LIBOCEDRUS*

The Genus *PICEA* is recognized thus  
leaves scattered, needle-shaped, four-sided, and stomatiferous on all four sides; branchlets with  
prominent leaf cushions separated by incised grooves and produced at the apex into a peg-like stalk  
(pulvinus) to which the leaf is attached.

species	leaf form	stomata	branchlets	terminal winter-buds	cones	leaf position	leaves	bud scales
<i>jezoensis</i>	flattened	white bands above only	glabrous shining	—	scale margin minutely lagged	—	not purgent	—
<i>omorika</i>	"	"	pubescent	—	with awl-shaped scales at the base	—	—	with a distinct green midrib
<i>mariana</i>	quadrangle-tar	lines on all four sides	pubescent, glandular	"	scales flexible, margins jagged	—	lustrous dark green, very short, obtuse odor strong	—
<i>orientalis</i>	"	"	pubescent	without awl-shaped scales at the base	—	—	lustrous dark green, very short, obtuse odor strong	—
<i>engelmanni</i>	"	"	"	" and scales flexible	—	—	glaucous, blue-green, " odor strong	—
<i>excelsa</i>	"	"	almost glabrous, not resinous pubescence minute or scattered	very long $2\frac{1}{2}$ -7" (2" or less) easily crushed	—	pointing forward	lustrous deep green	—
syn. — <i>abies</i>			glabrous	—	—	"	rounded, emarginate, tip scales revolute smelling	—
<i>canadensis</i>	"	"	resinous	short (2" or less) easily crushed	—	—	glaucous, soft; incurved; strong-smelling	—
syn. <i>glauca</i>			resinous	—	—	spreading	lustrous dark green, apex very sharp pointed	—
<i>polita</i>	"	"	"	not resinous, dark brown	—	—	dark brown	firmly appressed, dark brown
<i>pungens</i>	"	"	"	not resinous, light yellow-brown	—	—	light brown	revolute at apex, light brown

The Genus *PINUS* is recognized thus

needle-leaves in clusters surrounded at the base by sheaths of bud scales.

species	leaves in a cluster	sheaths	needles	branchlets	winter buds	cones	cone scales	twigs	upper bark	size of sheaths
<i>flexilis</i>	five	deciduous	slender margin entire	puberulous		dehiscent, seeds wingless				
<i>gembra</i>	"	"	margin serrulate	densely brown tomentose		seeds winged				
<i>excelsa</i>	"	"	slender 6-8", glabrous		"				glau-	
syn. <i>peuce</i>	"	"	serrulate, pendulous		"				gous	
<i>strobus</i>	"	"	thin, soft, 2-5", ser-	puberulous at 1st, soon	"				not	
<i>bungeana</i>	1-4	usual- ly $\frac{1}{2}$	usual-	2-5", rigid, serrulate	glabrous				glau-	
<i>jeffreyi</i>	usually	three	persistent	long, stiff, bloomy	"	"			gous	
<i>ponder-</i> <i>osa</i>	"	"	straight, blue-green	blue-green, not resinous					chalky-	
<i>rigida</i>	"	"	long 5-11", stout, bright green, back rounded	orange-brown, resinous, scales ap-					white	
<i>virgin-</i> <i>iana</i>	two	"	stout, dark green, back flat	fragrant when pressed broken	terminal					
<i>banksi-</i> <i>ana</i>	"	"	stout, twisted	light brown not bloomy	scale tips spreading				orange	
<i>sylyes-</i> <i>tris</i>	"	"	stout, twisted	not glaucous	tenaciously persistent, asymmetrical, not prickly					
<i>montana</i>	"	"	"	"	deciduous, short stalked	umbro obtuse	dull	bright orange		
syn. <i>mugo</i>						gray	yellow	peeling		
<i>resinosa</i>	"	"	not twisted, lustrous	"	deciduous, sub-sessile	black	"	dark brown-		
<i>nigra</i>	"	"	not twisted, dull	"	deciduous			ish	reddish	4/5"
									reddish	3/4"

The Genus *PSEUDOTSUGA* is recognized thus  
buds not resinous, pointed; needle-leaves soft and flexible, linear, flattened, spirally arranged  
but spreading in two opposite rows; branches marked by oval scars where leaves have fallen; fruit  
a cone.

The Genus *TAXODIUM* is recognized thus  
bark furrowed and scaly; branchlets of two kinds, persistent and with axillary buds or deciduous and  
without axillary buds; leaves alternate, flat, short, 2-ranked on the deciduous branchlets; fruit  
a globe, short-stalked cone.

The Genus *TAXUS* is recognized thus  
leaves linear, often curved and scythe-shaped, petiolate, spreading in 2 ranks, very dark green with  
two broad yellowish bands on the under side; branches irregularly alternate; fruit a bony nutlet  
surrounded or almost enclosed by a cup-shaped, fleshy, scarlet disk.

species	bud scales	leaves	midrib	color	foliage
baccata	obtuse, not keeled	gradually acuminate abruptly pointed	pointed above	very dark green	broad
cuspidata	acute, keeled		slightly raised	lighter green, turning brown	less broad, slender
canadensis	"	"			

The Genus *SEQUOIA* is recognized thus  
a tall, evergreen tree, often exceptionally large and of very great age; bark thick, red-brown, fibrous,  
deeply furrowed and ridged; leaves alternate, persistent, solitary, scattered, linear to linear-  
lanceolate, with 2 white stomatic lines on the under side, petiolate; also with scale-like leaves spir-  
ally arranged; branchlets all persistent; fruit a cone, woody, persistent, with divergent scales spir-  
ally arranged, widened at the top and with a depressed center, wrinkled, without distinct bracts, with  
6-9 flattened seeds; winter buds scaly.

*PSEUDOTSUGA* -- *TAXODIUM* -- *TAXUS* -- *SEQUOIA*

The Genus *THUJA* is recognized thus  
branchlets disposed in one plane, flattened; leaves scalelike, in pairs alternate at right angles,  
the lateral leaves nearly covering the facial ones; fruit a cone, ovoid-oblong or ovoid.

species	branchlets	cone scales	seeds	leaves	glands	leaf apex
<i>orientalis</i>	in vertical planes	thick	wingless			
<i>occidentalis</i>	planes not vertical	thin	winged	yellow-green beneath and with a gland		
<i>koreana</i>	"	"	"	with triangular markings	present	
<i>plicata</i>	"	thin, fertile scales usually 6	"	"	absent	acute
<i>standishii</i>	"	thin, fertile scales usually 4	"	"	"	obtuse

The Genus *TSUGA* is recognized thus  
branchlets with prominent leaf cushions; buds globose or ovoid, not resinous; leaves spirally arranged  
but appearing 2-ranked by reason of a twist in the petiole, linear, flattened and grooved above, and  
with 2 whitish bands of stomata on the under side; fruit a small cone of concave woody scales.

species	leaves	branchlets
<i>caroliniana</i>	margin entire	pubescent
<i>canadensis</i>	margin denticulate near the apex	"

## GLOSSARY

achene - a small, dry, hard, 1-celled, 1-seeded, fruit, indehiscent

acorn - a 1-celled, 1-seeded nut, fixed in a woody cup or involucre

acuminate - tapering at the end

acute - terminating in a sharp or well-defined angle

adventitious - imperfectly naturalized, as roots growing from internodes as well as nodes

aggregate - a collection or collected mass

alternate - (of leaves, etc.) arranged singly, at different points, not opposite

ament - a catkin or scaly spike

anastomosing - the ends of the veins curved to connect with the vein ahead, and by cross-veins forming a network

annual - of one year's growth or duration

anther - the tip of the stamen containing pollen

apetalous - having no petals

apiculate - ending in a short, pointed tip

appressed - lying close and flat against

armed - with spines or prickles

articulate - with a joint

articulate - having a joint or node; jointed

ascending - rising somewhat obliquely or curving upward

astrigent - having the power to contract or draw together organic tissues

attenuate - slenderly tapering; becoming very narrow

auricle - an ear-shaped appendage

auriculate - ear-shaped

awl-shaped - tapering upward from the base to a slender or rigid point

awn - a bristle-shaped appendage

axil - the angle formed by a leaf or branch with the stem

axillary - situated in an axil

bast - the fibrous portion of the inner bark

beaked - ending in a prolonged tip

bearded - bearing a long awn, or furnished with long or stiff hairs

berry - a fruit with the seeds embedded in a fleshy pulp which represents the entire pericarp except the outer layer or skin, as the tomato, grape, and currant.

bi or bis - a Latin prefix signifying two, twice, or doubly

biennial - of two years duration

bilabiate - two-lipped

bipinnate - doubly or twice pinnate

bivalvular - with two valves

blade - the expanded portion of a leaf, etc.

bract - a more or less modified leaf subtending a flower or belonging to an inflorescence, or sometimes belonging to the stem

bractlet - a secondary bract, as one upon the pedicel of a flower

bristles - coarse, stiff hairs

bristly - having or resembling bristles

bud - the rudimentary state of a stem or branch; an unexpanded flower

budding - the act of setting a bud of one tree in contact with the cambium of another for purposes of propagation

bulb - an underground leaf bud with fleshy scales or coats

bulbous - having the character of a bulb

bundle-trace - the tiny marks upon leaf scars representing the ends of the vascular bundles which penetrated the leaf and carried water and minerals to the leaf cells.

caducous - falling off early

calcareous - composed of, containing, or of the nature of lime or limestone

callus - a hard protuberance or callosity

calyx - the outer perianth of the flower

campanulate - bell-shaped; cup-shaped with a broad base

canescent - hoary with gray pubescence

capsular - belonging to or of the nature of a capsule

capsule - a dry, dehiscent fruit composed of more than one carpel

carpel - a simple pistil or one member of a compound pistil

catkin - an ament or a deciduous scaly spike of asexual, apetalous flowers

chaff - a small, thin scale or bract, becoming dry and membranous

chambered - (of the pith) having hollows or cavities

ciliate - marginally fringed with hairs

coalescence - the union of parts or organs of the same kind

collateral - subordinately connected; secondary

compound - composed of two or more similar parts united into one whole.

compound leaf - one divided into separate leaflets

compressed - flattened, especially laterally

conduplicate - folded together lengthwise

cone - a dry, multiple fruit composed of a dense aggregation of scales arranged symmetrically around an elongated axis, and bearing seeds on the upper side

confluent - running into each other; blended into one

coniferous - cone-bearing

conglomerate - a mass or collection of material

conical - shaped like a cone

connate - united; used especially of like structures joined from the start

connivent - coming into contact; converging

convolute - rolled up longitudinally

cordate - heart-shaped with the point upward

coriaceous - leathery in texture

corm - enlarged fleshy base of a stem, bulb-like but solid

corolla - the inner perianth; composed of petals

corrugated - wrinkled or in folds

corymb - a flat-topped or convex open flower cluster; in the stricter use of the word equivalent to a contracted raceme and progressing in its flowering from the margin inward

corymbose - in corymbs or corymb-like

crenate - dentate with the teeth much rounded

crenulate - finely crenate

cucullate - hooded or hood-shaped; cowled

cuneate - wedge-shaped; triangular with the acute angle downward

cuspidate - tipped with a sharp and rigid point

cyme - a broad and flattish determinate inflorescence, i.e. with its central or terminal flowers blooming earliest

cymose - bearing cymes or cyme-like

deciduous - not persistent; not evergreen

decurrent (leaf) - extending down the stem below the insertion

dehiscent - opening regularly by valves or slits, etc. as a capsule or anther

deltoid - triangular; like an equilateral triangle

dentate - toothed, usually with the teeth directed outward

denticulate - minutely dentate

depressed somewhat flattened from above

di-, dis- - a Greek prefix signifying two or twice

diadelphous (stamens) - combined in two sets

diaphragms - dividing membranes or partitions

diffuse - widely or loosely spreading

dioecious - of two households; unisexual, with two kinds of flowers on separate plants

disc (disk) - a development of the receptacle at or around the base of the pistil

dissected cut or divided into numerous segments

distichous - in two vertical ranks  
distinct - separate; not united; evident  
divaricate - widely divergent  
divided - lobed to the base  
dorsal - on or related to the back or outer surface of an organ  
drupe - a fleshy or pulpy fruit with the inner portion of the pericarp hard or stony, one-celled and one-seeded, viz. plum  
drupelet - a diminutive drupe  
e- or ex- - a Latin prefix meaning without  
ecology - concerning the relation of plants to their surroundings  
ellipsoid - oblong with rounded ends  
elliptic - of or pertaining to or shaped like an ellipse  
emarginate - having a shallow notch at the extremity  
endogenous - growing throughout the substance of a stem instead of by superficial layers  
entire - without tothing or division  
erose - as if gnawed  
exfoliating - cleaving off in thin layers  
exotic - foreign; not native; appearing as if belonging to another part of the world  
exserted - projecting beyond an envelope, as stamens from a corolla  
falcate - scythe-shaped; curved and flat, tapering gradually  
fascicle - a close bundle or cluster  
fastigiate (branches) - erect and near together; columnar  
fibrous - composed of or resembling fibers  
filament - the part of the stamen which supports the anther  
filiform - thread-shaped  
fimbriate - fringed  
fissured - cracked or split  
flaking - breaking off in small, flat fragments or scales  
flaky - easily separable into flakes  
flexible - capable of being bent  
flexuous - zigzag, bending alternately in opposite directions  
foliaceous - leaflike in texture or appearance  
foliate - having leaves  
foliolate - having leaflets  
forked - divided into nearly equal branches

fluted - showing parallel grooves

fruit - the seed-bearing product of a plant

fusiform - spindle-shaped; swollen in the middle and narrowing toward each end

gibbous - protuberant or swollen on one side

glabrate - somewhat glabrous or becoming glabrous

glabrescent - inclined to be glabrous

glabrous - smooth; not rough, pubescent, or hairy

gland - a secreting surface or structure; any protuberance or appendage having the appearance of such an organ

glandular - bearing glands or of the nature of a gland

glaucous - covered or whitened with a bloom (wild yeast)

glazed - smooth and shining; glassy

globose - globe-like; nearly globular

glutinous - sticky

gnarled - distorted, knotty; twisted and cross-grained

grafting - the process of propagation by inserting a scion into a tree

habit - the general appearance of a plant

hastate - like an arrow-head

head - a dense cluster of sessile or nearly sessile flowers on a very short axis or receptacle

hispid - beset with rigid or bristly hairs or with bristles

hoary - grayish-white with a fine, close pubescence

hybrid - a cross-breed of two species

humus - decayed vegetable matter in the soil

husk - the outer covering of fruits or seeds

imbricate - overlapping, either vertically or spirally

impressed - bent inward; hollowed or furrowed as if by pressure

incised - cut sharply and irregularly, more or less deeply

indefinite - inconstant in number or very numerous

indehiscent - not opening by valves, etc; remaining persistently closed

inflated - bladdery; puffed out

inflorescence - the flowering part of a plant, and especially the mode of its arrangement

inserted - attached to or growing out of

inter- or intra- - between

internode - the portion of a stem between two nodes or growing points

introduced - brought intentionally from another region, as for purposes of cultivation

involute - a circle or collection of bracts surrounding a flower cluster or head, or a single flower

irregular - showing inequality in size, form, or union

keel - a central dorsal ridge, like the keel of a boat

keeled - having a keel or ridge

labiate - lipped

laciniate - slashed; cut into narrow, pointed lobes

lanceolate - shaped like a lance-head; several times longer than wide, broadest above the base and narrowed to the apex

lateral - pertaining to, directed from, or directed toward the side

leaflet - a single division of a compound leaf

legume - the fruit of the Leguminosae, formed of a single pistil and usually splitting open by both sutures; bean-like

leguminous - pertaining to a legume or to the Leguminosae

lenticel - breathing pore of leaf or stem

lenticular - lentil-shaped; of the shape of a double convex lens; having lenticels

limb - the expanded portion of any leaf or petal; a branch of a tree growing out from the trunk

linear - long and narrow, with parallel margins

lobe - any segment of an organ, especially if rounded

lobed - divided into or bearing lobes

median - pertaining to the middle

membrane - a thin, sheetlike structure connecting other structures or serving to cover or line some part or organ

membranous - thin, rather soft and more or less translucent tissue; pertaining to a membrane

-merous - in composition, having parts, as 2-merous, having two parts of each kind

midrib - the central or main vein of a leaf

monodelphous (stamens) - united by their filaments into a tube or column

monoecious - with stamens and pistils in separate flowers on the same plant; of one household

mucilaginous - adhesive or slimy with vegetable gum

mucronate - tipped with a short and small abrupt tip; spiny-tipped (veins).

mucronulate - with a minute spiny tip; inclined to be mucronate

multiple - containing or consisting of more than one

nerve - a simple or unbranched vein or slender rib

netted (veination) - meshed like a net

node - growing points along the stem; the place along the stem which normally bears a leaf or leaves

nut - a hard indehiscent 1-celled and 1-seeded fruit, though usually resulting from a compound ovary



petiole - the stem of a leaf

pilose - hairy, especially with soft hairs

pinnate (leaf) - compound with the leaflets arranged on each side of a common petiole

pinnatifid - pinnately cleft

pistil - the seed-bearing organ of a flower, consisting of the ovary, stigma and style when present

pistillate - provided with pistils, and in its more proper sense without stamens

pitted - marked with small depressions or pits

plicate folded into plaits, usually lengthwise

plumose - having fine hairs on each side, like the barbs of a feather

pod - any dry and dehiscent fruit

pollen - the fecundating grains contained in the anther

polliniferous - bearing pollen

pome - a fleshy fruit with the seeds contained in a stiff-walled cells like the apple

porous - pierced with many small holes or pores

prickle - a small spine, or more or less slender, sharp outgrowth from the bark or rind

procumbent - lying on the ground or trailing but without rooting at the nodes

prostrate - lying flat on the ground

puberulent - minutely pubescent; inclined to be pubescent

pubescent - covered with hairs, especially if short, soft, and downlike

pulvinus (i) - an enlargement or protuberance at the base or insertion of a leaf

punctate - dotted with depressions, or with translucent internal glands or colored dots

pungent - having power to affect the nerves of sensation, as by pricking, stinging or piercing; acrid

pyriform - pear-shaped

raceme - a simple inflorescence of pedicelled flowers upon a common more or less elongated axis

racemose - in racemes or resembling racemes

rachis - the axis of a spike or of a compound leaf

radiate - spreading from or arranged around a common center

receptacle - the expanded portion of an axis bearing the organs, as pistil and stamens

recurved - curved downward or backward

reflexed - abruptly bent or turned downward

regular - uniform in shape or structure

reniform - kidney-shaped

repand - with a slightly uneven and somewhat sinuate margin  
resinous - with resin  
reticulate - net-veined  
retuse - with a shallow notch at a rounded apex  
revolute - rolled backward from the margins or apex  
rhachis - see rachis  
rib - a primary or prominent vein of a leaf  
rotate - wheel-shaped  
rufous - see rufus  
rufus - reddish-brown  
rugged - having a surface full of abrupt inequalities; rough; uneven  
rugose - wrinkled  
salver-shaped - (corolla) having a slender tube abruptly expanded into a flat limb  
samara - an indehiscent winged fruit  
scabrous - rough to the touch  
scarious - thin, dry, and membranaceous, not green  
scurfy - with exfoliated skin thrown off in minute scales  
segment - one of the parts of leaf or other like organ that is cleft or divided  
sepal - a division of the calyx  
serrate - having sharp teeth pointing forward  
serrulate - finely serrate  
sessile - without footstalk of any kind  
setose - beset with bristles  
sheath - a tubular envelope  
silky - covered with close-pressed, soft, and straight pubescence  
simple - of one piece, not compound  
sinuous - curving in and out  
sinuate - with the outline of the margin strongly wavy  
sinus - the cleft or recess between two lobes  
smooth - without roughness or pubescence  
spike - a form of simple inflorescence with the flowers sessile or nearly so upon a more or less elongated common axis  
spine - a sharp woody or rigid outgrowth from the stem  
spinescent - spine-like or having spines

spiny - with spines

spurs - stiff, sharp spines, often developing into twigs

stamen - one of the pollen-bearing organs of the flower

staminode - a sterile stamen, or any structure without anther corresponding to a stamen

standard - the upper dilated petal of a papilionaceous flower

stellate - star-shaped

stem - the main ascending axis of a plant

sterile - unproductive, as a flower without a pistil or without stamens

stigma - the sticky tip of the pistil to which the pollen clings for fertilization

stippled - an effect obtained by dots and marked as if with a twisting motion of brush or sponge

stipular - belonging to the stipules

stipulate - having stipules

stipule - an appendage at the base of a petiole or on each side of its insertion

stratified - in layers or horizontal planes

striate - marked with fine longitudinal lines or ridges

style - the usually attenuated portion of the pistil connecting the stigma and ovary

sub- - a Latin prefix, usually signifying somewhat or slightly

sub-evergreen - not quite evergreen but almost so

suborbicular - nearly circular

subulate - awl-shaped

subcordate - somewhat heart-shaped

succulent - juicy, fleshy

sulcate - grooved or furrowed

superposed - placed upon or above one another

suture - a line or dehiscence or cleavage

symmetrical - regular in form or as to the number of parts

tap-root - a single long descending root, as in the dandelion

terete - having a circular transverse section

ternate - in threes

tomentose - densely pubescent with matted wool

tomentulose - inclined to be tomentose

tomentum - the matted wool on a leaf or twig

tortuous - with irregular bends or turns

translucent - allowing some passage of light so that objects may be partly evident but not clearly visible  
trifoliate - with three leaflets

truncate - ending abruptly as if cut off transversely

tuber - a thickened and short underground branch having numerous buds or eyes

tubercle - a small tuber or tuber-like body, usually subterranean

turbinate - top-shaped

umbel - an inflorescence in which the peduncles or pedicels of a cluster spring from the same point

umbellate - in or like an umbel

undulate - with a wavy surface

uni- - in composition, one

unisexual - of one sex, either staminate or pistillate only

urceolate - urn-shaped

valvate - opening by valves, as a capsule; or meeting by the edges without overlapping

valve - one of the pieces into which a capsule splits

valvular - having valves

velutinous - velvety

ventral - on or relating to the front or inner surface of an organ

verrucose - covered with wart-like projections

villous - bearing long and soft hairs

viscid - glutinous, sticky

whorl - an arrangement of leaves in a circle around the stem

whorled - with three or more leaves, buds, scars, or twigs in a circle around the stem

wing - any membranous or thin expansion bordering or surrounding an organ; the lateral petal of a papilionaceous corolla

woolly - clothed with long and tortuous or matted hairs

**NOMENCLATURE**

**Deciduous Trees**

*Acanthopanax ricinifolium* (Seem.) - Castor Aralia. syn. *Kalopanax pictus*  
*Acer campestre* (Linn.) - Hedge or Field Maple  
*Acer dasycarpum* (Ehrh.) - Silver or Soft Maple. syn. *Acer saccharinum*  
*Acer japonicum* (Thunb.) - Japanese or Full-Moon Maple  
*Acer negundo* (Linn.) - Box Elder  
*Acer nigrum* (Michx.) - Black Maple  
*Acer palmatum* (Thunb.) - Japanese Maple, Palmate-leaved Maple  
*Acer pennsylvanicum* (Linn.) - Moosewood, Striped or Goosefoot Maple  
*Acer platanoides* (Linn.) - Norway Maple  
*Acer pseudoplatanus* (Linn.) - Sycamore Maple  
*Acer rubrum* (Linn.) Red Maple, Scarlet Maple  
*Acer saccharinum* (Linn.) - Silver Maple. syn. *Acer dasycarpum*  
*Acer saccharum* (Marsh.) - Sugar Maple, Hard Maple  
*Acer spicatum* (Lam.) - Mountain Maple  
*Aesculus glabra* (Willd.) - Ohio Buckeye  
*Aesculus hippocastanum* (Linn.) - Horsechestnut  
*Ailanthus altissima* (Mill.) - Stinking Chun, Tree of Heaven. syn. *A.glandulosa*  
*Ailanthus glandulosa* (Desf.) - Tree of Heaven, Ash-can Tree. syn. *A.altissima*  
*Alnus glutinosa* (Gaertn.) - Black or European Alder  
*Alnus incana* (Willd.) - Speckled or Hoary-leaved Alder  
*Amelanchier canadensis* (Med.) - Juneberry, Downy Shadblow  
*Amelanchier laevis* (Wieg.) - Shadblow, Allegheny Serviceberry  
*Asimina triloba* (Dunal.) Papaw  
*Betula alba* (Linn.) - White Birch. syn. *Betula pendula*  
*Betula lenta* (Linn.) - Cherry Birch, Sweet Birch  
*Betula lutea* (Michx.) - Yellow Birch  
*Betula nigra* (Linn.) - Red or River Birch  
*Betula papyrifera* (Marsh.) - Paper or Canoe Birch  
*Betula pendula* (Roth.) - White Birch. syn. *B.alba*  
*Betula populifolia* (Ait.) - Gray Birch, Poplar Birch  
*Carya cordiformis* (Wangh.) - Bitternut Hickory. syn. *Hicoria cordiformis*  
*Carya glabra* (Mill.) - Pignut Hickory. syn. *Hicoria glabra*  
*Carya laciniosa* (Michx.) - Kingnut or Big Shellbark Hickory. syn. *Hicoria laciniosa*  
*Carya ovata* (Mill.) - Shagbark Hickory. syn. *Hicoria ovata*  
*Carya pecan* (Marsh.) - Pecan. syn. *Hicoria pecan*  
*Carya tomentosa* (Lam.) - Mockernut or White Hickory. syn. *Hicoria alba*  
*Carpinus caroliniana* (Walt.) - Blue Beech, Ironwood.  
*Castanea dentata* (Borkh.) - Chestnut  
*Castanea mollissima* (Blume.) - Chinese Chestnut  
*Catalpa bignonioides* (Walt.) - Southern Catalpa  
*Catalpa kaempferi* (Sieb. & Zucc.) - Japanese Catalpa. syn. *Catalpa ovata*  
*Catalpa speciosa* (Engelm.) - Western Catalpa  
*Catalpa ovata* (Don.) - Japanese Catalpa syn. *Catalpa Kaempferi*  
*Cedrela sinensis* (Juss.) - Chinese Cedrela  
*Celtis occidentalis* (Linn.) - Hackberry  
*Cercidiphyllum japonicum* (Sieb. & Zucc.) - Katsura tree, Cercis-leaf  
*Cercis canadensis* (Linn.) - Redbud or Judas tree  
*Cladrastis lutea* (Koch.) - Yellow-wood, Virgilia  
*Cornus alternifolia* (Linn.) - Alternate-leaved or Pagoda Dogwood  
*Cornus florida* (Linn.) - Flowering Dogwood  
*Cornus mas* (Linn.) - Cornelian Cherry  
*Crataegus coccinea* (Linn.) - Red Haw, Scarlet Thorn. syn. *Crataegus intricata*  
*Crataegus cordata* (Ait.) - Washington Thorn. syn. *Crataegus phaenopyrum*  
*Crataegus crus-galli* (Linn.) - Cockspur Thorn  
*Crataegus monogyna* (Jacq.) - English Hawthorn  
*Crataegus oxyacantha* (Linn.) - English Hawthorn White Thorn, Quickset.  
*Crataegus phaenopyrum* (L.f.) - Washington Thorn. syn. *Crataegus cordata*  
*Crataegus punctata* (Jacq.) - Dotted Hawthorn  
*Diospyros virginiana* (Linn.) - Persimmon  
*Elaeagnus angustifolia* - (Linn.) - Russian Olive, Oleaster  
*Fagus americana* (Sweet.) - Beech, Silver Beech. syn. *Fagus grandifolia*  
*Fagus grandifolia* (Ehrh.) - Silver Beech. syn. *Fagus americana*  
*Fagus sylvatica* (Linn.) - European Beech

*Fraxinus americana* (Linn.) - White Ash  
*Fraxinus excelsior* (Linn.) - European Ash  
*Fraxinus lanceolata* (Borkh.) - Green Ash. syn. *Fraxinus pennsylvanica* Lanceolata  
*Fraxinus nigra* (Marsh.) - Black Ash or Hoop Ash  
*Fraxinus pennsylvanica* (Marsh.) - Red Ash  
*Fraxinus quadrangulata* (Michx.) - Blue Ash  
*Ginkgo biloba* (Linn.) - Ginkgo, Maidenhair Tree  
*Gleditsia triacanthos* (Linn.) - Honey Locust  
*Gymnocladus dioica* (Koch) - Kentucky Coffee Tree. syn. *G. dioicus* (Linn.)  
*Halesia tetrapetala* (Linn.) - Silverbell, Snowdrop tree. syn. *Halesia tetrapetala*  
*Halesia tetrapetala* (Ellis.) - Silverbell, Snowdrop tree. syn. *H. carolina*  
*Hicoria alba* (Brit.) - Mockernut or White Hickory. syn. *Carya tomentosa*  
*Hicoria cordiformis* (Brit.) - Bitternut Hickory. syn. *Carya cordiformis*  
*Hicoria glabra* (Brit.) - Pignut Hickory. syn. *Carya glabra*  
*Hicoria laciniosa* (Sarg.) - Kingnut or Big Shellbark Hickory. syn. *Carya laciniosa*  
*Hicoria ovata* (Brit.) - Shagbark Hickory. syn. *Carya ovata*  
*Hicoria pecan* (Brit.) - Pecan. syn. *Carya pecan*  
*Juglans cinerea* (Linn.) - Butternut, White Walnut  
*Juglans nigra* (Linn.) - Black Walnut  
*Juglans regia* (Linn.) - English or Persian Walnut  
*Juglans sieboldiana* (Maxim.) - Japanese Walnut, Kurume  
*Koelreuteria paniculata* (Laxm.) - Japanese Varnish Tree  
*Kalopanax pictus* (Thunb.) - Castor Aralia. syn. *Acanthopanax ricinifolium*  
*Laburnum anagyroides* (Med.) - Golden Rain tree. syn. *Laburnum vulgare*  
*Laburnum vulgare* (Griseb.) - Golden Chain tree. syn. *Laburnum anagyroides*  
*Liquidambar styraciflua* (Linn.) - Sweet Gum  
*Liriodendron tulipifera* (Linn.) - Tulip tree, Whitewood  
*Maclura pomifera* (Schneid.) - Osage Orange, Hedge Apple  
*Magnolia acuminata* (Linn.) - Cucumber Tree  
*Magnolia glauca* (Linn.) - Sweet Bay. syn. *Magnolia virginiana*  
*Magnolia soulangeana* (Soul.) - Saucer Magnolia  
*Magnolia tripetala* (Linn.) - Umbrella Magnolia  
*Magnolia virginiana* (Linn.) - Sweet Bay. syn. *Magnolia glauca*  
*Malus angustifolia* (Michx.) - Southern Crab  
*Malus arnoldiana* (Sarg.) - Arnold Crab  
*Malus baccata* (Borkh.) - Siberian Crab  
*Malus coronaria* (Mill.) Garland Crab  
*Malus floribunda* (Sieb.) Japanese Flowering Crab  
*Malus halliana* (Koeh.) Hall's Crab  
*Malus ioensis* (Brit.) - Prairie Crab  
*Malus sargentii* (Rehd.) - Sargent Crab  
*Malus schiedeckeri* (Zab.) - Schiedeckeri Crab  
*Malus spectabilis* (Borkh.) Chinese Flowering Crab  
*Morus alba* (Linn.) - White Mulberry, Chinese Mulberry  
*Morus rubra* (Linn.) - Red Mulberry  
*Nyssa sylvatica* (Marsh.) - Tupelo, Pepperidge, Sour Gum  
*Ostrya virginiana* (Koch.) - Hop Hornbeam, Ironwood  
*Paulownia imperialis* (Seib. & Zucc.) - Royal Paulownia. syn. *Paulownia tomentosa*  
*Paulownia tomentosa* (Thunb.) Royal Paulownia. syn. *P. imperialis*  
*Phellodendron amurense* (Rupr.) - Amoer Cork Tree  
*Phellodendron sachalinense* (Sarg.) - Saghalin Cork Tree  
*Platanus acerifolia* (Willd.) - London Plane Tree  
*Platanus occidentalis* (Linn.) - Sycamore, Buttonwood  
*Platanus orientalis* (Linn.) - Platan, European Plane Tree  
*Populus alba* (Linn.) - White Poplar, Abele  
*Populus deltoides* (Marsh.) - Carolina Poplar, Cottonwood  
*Populus grandidentata* (Michx.) - Coarse-toothed Poplar  
*Populus nigra* (Linn.) - Black Poplar  
*Populus simoni* (Carr.) - Simon Poplar  
*Populus tremuloides* (Michx.) - Quaking Aspen  
*Prunus avium* (Linn.) - Sweet Cherry  
*Prunus cerasifera* (Ehrh.) - Cherry Plum  
*Prunus cerasus* (Linn.) - Dwarf or Pie Cherry  
*Prunus padus* (Linn.) - Bird Cherry  
*Prunus pennsylvanica* (Linn.) - Pin Cherry, Bird Cherry  
*Prunus persica* (Sieb. & Zucc.) - Peach  
*Prunus serotina* (Ehrh.) - Wild Black Cherry  
*Prunus subhirtella* (Miq.) - Rosebud or Japanese Cherry  
*Prunus virginiana* (Linn.) - Choke Cherry

*Pyrus communis* (Linn.) - Common Pear  
*Quercus alba* (Linn.) - White Oak  
*Quercus bicolor* (Willd.) - Swamp White Oak  
*Quercus coccinea* (Muench.) - Scarlet Oak  
*Quercus imbricaria* (Michx.) - Shingle Oak  
*Quercus macrocarpa* (Michx.) - Bur Oak, Mossy-cup Oak  
*Quercus Marilandica* (Muench.) - Black Jack or Jack Oak  
*Quercus palustris* (Linn.) - Pin Oak  
*Quercus phellos* (Linn.) - Willow Oak  
*Quercus prinus* (Linn.) - Basket Oak. syn *Quercus michauxii*  
*Quercus robur* (Linn.) - English Oak  
*Quercus rubra* (DuRoi.) - Red Oak. syn. *Quercus borealis* maxima  
*Quercus velutina* (Lam.) - Black Oak  
*Robinia pseudoacacia* (Linn.) - Black Locust  
*Salix alba* (Linn.) - White or Huntingdon Willow  
*Salix babylonica* (Linn.) - Weeping Willow, Napoleon Willow  
*Salix caprea* (Linn.) - Goat Willow  
*Salix vitellina* (Linn.) Golden Willow. syn. *Salix alba* vitellina  
*Sassafras albidum* (Nutt.) - Sassafras. syn. *Sassafras variifolium*  
*Sassafras variifolium* (Kuntze.) - Sassafras. syn. *Sassafras albidum*  
*Sophora japonica* (Linn.) - Chinese Scholartree  
*Sorbus americana* (Marsh.) - Mountain Ash  
*Sorbus aucuparia* (Linn.) - European Mountain Ash, Roan tree  
*Syringa japonica* (Decne.) - Japanese Tree Lilac. syn. *Syringa amurensis* (Rupr.)  
*Tilia americana* (Linn.) - Basswood, Whitewood  
*Tilia cordata* (Mill.) - Littleleaf Linden  
*Tilia europaea* (Linn.) - Common Linden, Lime tree. syn. *Tilia vulgaris*  
*Tilia heterophylla* (Vent.) - Beetree Linden  
*Tilia petiolaris* (Hook.f. not D.C.) - Weeping White Linden  
*Tilia tomentosa* (Moench.) - Silver Linden  
*Tilia vulgaris* (Hayne.) - Common Linden, Lime tree. syn. *Tilia europaea*  
*Ulmus americana* (Linn.) - American or White Elm  
*Ulmus campestris* (Mill.) - English Elm. syn. *Ulmus procera*  
*Ulmus fulva* (Michx.) - Red or Slippery Elm  
*Ulmus glabra* (Huds.) - Scotch or Wych Elm  
*Ulmus procera* (Salisb.) - English Elm. syn. *Ulmus campestris*  
*Ulmus pumila* (Linn.) - Chinese or Siberian Elm  
*Ulmus thomasi* (Sarg.) - Rock Elm. syn. *Ulmus racemosa*  
*Ulmus racemosa* (Thomas, not Borkh.) - Rock Elm. syn. *Ulmus thomasi*  
*Zelkova serrata* (Mak.) - Sawleaf Zelkova

#### DECIDUOUS SHRUBS

*Acanthopanax pentaphyllum* (March.) - Five-fingered Aralia. syn. *A. sieboldiana*  
*Acanthopanax sieboldianus* (Mak.) - 5-fingered Aralia. syn. *A. pentaphyllum*  
*Acer ginnala* (Maxim.) - Amur Maple  
*Acer tataricum* (Linn.) - Tatarian Maple  
*Aesculus pavia* (Linn.) - Damask Horsechestnut  
*Aesculus parviflora* (Walt.) - Bottlebrush Buckeye  
*Alnus rugosa* (Spreng.) - Smooth Alder, Hazel Alder  
*Alnus viridis* (D.C.) - European Green Alder  
*Amelanchier alnifolia* (Nutt.) - Saskatoon. Syn. *Amelanchier canadensis* var.  
*Amelanchier ovalis* (Med.) European Shadblow. syn. *Amelanchier rotundifolia*  
*Amelanchier rotundifolia* (Dum.-Cours.) - European Shadblow. syn. *A. ovalis*  
*Amorpha canescens* (Nutt.) - Lead Plant  
*Amorpha fruticosa* (Linn.) - False Indigo, Indigobush  
*Aralia spinosa* (Linn.) - Hercules Club, Angelica Tree  
*Aronia arbutifolia* (Spach.) - Red Chokeberry  
*Aronia melanocarpa* (Spach.) - Black Chokeberry  
*Azalea amoena* (Lindl.) - Amoena Azalea. syn. *Azalea obtusum*  
*Azalea arborescens* (Pursh.) - Sweet or Smooth Azalea. syn. *Rhododendron arborescens*  
*Azalea mollis* (molle) (Blume.) - Chinese Azalea  
*Azalea nudiflora* (nudiflorum) (Linn.) - Pinxterbloom  
*Azalea obtusum* (Lindl.) - Amoena Azalea. syn. *Azalea amoena*

*Azalea obtusum* (Lindl.) - Sweet or Smooth Azalea. syn. *Azalea amoena*  
*Azalea roseum* (Rehd.) - Downy Pinxterbloom  
*Azalea vaseyi* (Rehd.) - Pinkshell Azalea. syn. *Rhododendron vaseyi* (Gray)  
*Azalea viscosa* (viscosum) (Linn.) - Swamp Azalea or Swamp Honeysuckle  
*Baccharis halimifolia* (Linn.) - Groundsel Bush, Saltbush  
*Benzoin aestivale* (Nees.) - Spicebush, Spicewood. syn. *Lindera benzoin*  
*Berberis buxifolia* (Poir.) - Box Barberry  
*Berberis darwini* (Hook.) - Darwin Barberry  
*Berberis thunbergi* (D.C.) - Thunberg's or Japanese Barberry  
*Berberis wilsoni* (Hemsl.) - Wilson Barberry  
*Berberis vulgaris* (Linn.) - Common Barberry  
*Betula nana* (Linn.) - Dwarf Birch  
*Betula pumila* (Linn.) - Hairy Dwarf Birch  
*Buddleia davidi* (Franch.) - Butterfly Bush. syn. *Buddleia variabilis*  
*Buddleia variabilis* (Hemsl.) - Butterfly bush. syn. *Buddleia davidi*  
*Calycanthus floridus* (Linn.) - Carolina Allspice, Strawberry Bush  
*Caragana arborescens* (Lam.) Pea Shrub, Pea Tree  
*Castanea pumila* (Mill.) - Chinquapin  
*Catalpa bungei* (C.A.Mey.) - Manchurian Catalpa  
*Ceanothus americanus* (Linn.) - New Jersey Tea, Redroot  
*Cephalanthus occidentalis* (Linn.) - Buttonbush, Honeyballs  
*Chaenomeles lagenaria* (Loisel.) - Japanese Quince. syn. *Cydonia japonica*  
*Chionanthus virginica* (virginicus) (Linn.) - White Fringe, Fringe-tree  
*Clethra alnifolia* (Linn.) - Sweet Pepperbush, Summersweet  
*Colutea arborescens* (Linn.) - Bladder Senna  
*Comptonia asplenifolia* (Gaertn.) - Sweet Fern. syn. *Comptonia peregrina*  
*Comptonia peregrina* (Coul.) - Sweet Fern. syn. *Comptonia asplenifolia*, *Myrica*  
*Cornus alba* (Linn.) - Red or Tartarian Dogwood  
*Cornus amomum* (Mill.) - Silky Cornel, Kinnikinnick  
*Cornus baileyi* (Coul. & Evans) - Bailey Dogwood  
*Cornus paniculata* (L'Her) - Gray or Paniced Dogwood. syn. *Cornus racemosa*  
*Cornus racemosa* (Lam.) - Gray Dogwood. syn. *Cornus paniculata*  
*Cornus sanguinea* (Linn.) - Bloodtwig Dogwood  
*Cornus stolonifera* (Michx.) - Red-twigg Dogwood, Red-osier Dogwood  
*Corylus americana* (Walt.) - American Hazel-nut  
*Corylus avellana* (Linn.) - Filbert, European Hazel  
*Corylus cornuta* (March.) - Cuckold Hazel. syn. *Corylus rostrata*  
*Corylus rostrata* (Ait.) - Beaked Hazel. syn. *Corylus cornuta*  
*Cotinus coggyria* (Scop.) - Smoketree. syn. *Rhus cotinus*  
*Cotoneaster acutifolia* (Turcz.) - Peking Cotoneaster  
*Cotoneaster adpressa* (Bois.) - Creeping Cotoneaster  
*Cotoneaster divaricata* (Rehd. & Wilson) - Spreading Cotoneaster  
*Cotoneaster horizontalis* (Decne.) - Rock Cotoneaster, Quinceberry  
*Cotoneaster hupehensis* (Rehd. & Wilson) - Hupeh Cotoneaster  
*Cotoneaster racemiflora* (Koch.) - Coin-leaf Cotoneaster  
*Cydonia japonica* (Pers.) - Japanese Quince. syn. *Chaenomeles lagenaria*  
*Cytisus scoparius* (Link.) - Scotch Broom  
*Daphne mezereum* (Linn.) - Mezereon or Flowering Spurge  
*Deutzia gracilis* (Sieb. & Zucc.) Slender Deutzia  
*Deutzia lemoinei* (Hort.) Lemoine Deutzia  
*Deutzia scabra* (Thunb.) - Fuzzy Deutzia  
*Dirca palustris* (Linn.) - Leatherwood, Wicopy  
*Elaeagnus argentea* (Pursh.) - Silverberry, Wolf Willow. syn. *E. commutata*  
*Elaeagnus commutata* (Bernh.) - Silverberry. syn. *Elaeagnus argentea*  
*Elaeagnus longipes* (Gray) - Cherry Elaeagnus, Gumi. syn. *E. multiflora*  
*Elaeagnus multiflora* (Thunb.) - Cherry Elaeagnus. syn. *E. longipes*  
*Elaeagnus umbellata* (Thunb.) - Autumn Elaeagnus  
*Euonymus alata* (alatus) (maxim.) - Winged Burning Bush  
*Euonymus americanus* (Linn.) - Brook Euonymus  
*Euonymus atropurpureus* (Jacq.) - Wahoo, Skewerwood. syn. *E. atropurpurea* (Jacq.)  
*Euonymus europeus* (Linn.) - Spindle Tree  
*Euonymus yedoensis* (Koehne.) - Yeddo Euonymus  
*Exochorda grandiflora* (Lindl.) - Pearlbrush. syn. *Exochorda racemosa*  
*Exochorda racemosa* (Lindl.) - Pearlbrush. syn. *Exochorda grandiflora*  
*Forsythia intermedia* (Zabel.) - Golden Bell  
*Forsythia suspensa* (Vahl.) - Golden Bell  
*Forsythia viridissima* (Lindl.) - Golden Bell

*Genista tinctoria* (Linn.) - Dyer's Greenwood, Woodwaxen  
*Hamamelis japonica* (Sieb.&Zucc) - Japanese Witch-hazel  
*Hamamelis virginiana* (Linn.) - Witch-hazel  
*Hibiscus syriacus* (Linn.) - Althaea, Rose of Sharon  
*Hippophae rhamnoides* (Linn.) - Sea Buckthorn  
*Hydrangea arborescens* (Linn.) - Smooth Hydrangea  
*Hydrangea paniculata* (Sieb.) - Paniced or Plumed Hydrangea  
*Hydrangea quercifolia* (Bartram.) - Oak-leaved Hydrangea  
*Hypericum calycinum* (Linn.) - Aaronsbeard  
*Hypericum densiflorum* (Pursh.) - Bushy St.John's Wort  
*Ilex verticillata* (Linn.) - Northern Holly, Black Alder, Winterberry  
*Kerria japonica* (Wm.Kerr) - Kerria, Globe-flower, Corchorus  
*Kolkwitzia amabilis* (Graebn.) - Beautybush  
*Ligustrum amurense* (Carr.) - Amur Privet  
*Ligustrum ibolium* (Coe.) - Ibolium Privet  
*Ligustrum ibota* (Sieb.) - Ibota Privet  
*Ligustrum ovalifolium* (Hassk.) - California Privet  
*Ligustrum quihoui* (Carr.) - Quihou Privet  
*Ligustrum vulgare* (Linn.) - Common Privet, or Prim  
*Lindera benzoin* (L.) Bl. - Spicebush. syn. Benzoin aestivale  
*Lonicera bella* (Zabel.) - Belle Honeysuckle  
*Lonicera chrysanthia* (Turcz.) - Coralline Honeysuckle  
*Lonicera fragrantissima* (Lindl.) - Fragrant or Winter Honeysuckle  
*Lonicera korolkowi* (Stapf.) - Blue-leaf Honeysuckle  
*Lonicera maackii* (Maxim.) - Amur Honeysuckle  
*Lonicera morrowii* (Gray) - Morrow Honeysuckle  
*Lonicera standishi* (Carr.) - Standish Honeysuckle  
*Lonicera tatarica* (Linn.) - Tatarian Honeysuckle  
*Lonicera xylosteum* (Linn.) - Fly Honeysuckle  
*Lycium chinense* (Mill.) - Chinese Box Thorn or Matrimony Vine  
*Lycium halimifolium* (Mill.) - Common Matrimony Vine  
*Magnolia stellata* (Maxim.) - Star Magnolia  
*Myrica carolinensis* (Mill.) - Northern Bayberry or Candleberry  
syn. *Myrica pennsylvanicum*  
*Myrica gale* (Linn.) - Sweet Gale or Bog Myrtle  
*Myrica pennsylvanica* (Lois.) - Candleberry. syn *Myrica carolinensis*  
*Nemopanthus mucronatus* (Trel.) - Mountain Holly  
*Philadelphus coronarius* (Linn.) - Mock Orange, Sweet Syringa  
*Philadelphus falconeri* (Sarg.) - Star Mock-orange  
*Philadelphus gordonianus* (Lindl.) - Gordon Mock-orange  
*Philadelphus lemoinei* (Lemoine) - Lemoine Mock-orange  
*Philadelphus zeyheri* (Schrad.) - Zeyher Mockorange  
*Photinia villosa* (DC.) - Chinese Christmas-berry or Photinia  
*Physocarpus opulifolius* (Maxim.) - Ninebark  
  
*Prunus glandulosa* (Thunb.) - Dwarf Flowering Almond.  
*Prunus tomentosa* (Thunb.) - Nanking or Nankeen Cherry  
*Prunus triloba* (Lindl.) - Flowering Almond, Flowering Plum  
*Ptelea trifoliata* (Linn.) - Wafer Ash  
*Quercus prinoides* (Willd.) - Chinquapin, Chincapin Oak  
*Rhamnus caroliniana* (Walt.) - Carolina Buckthorn or Indian Cherry  
*Rhamnus cathartica* (Linn.) - Buckthorn  
*Rhamnus frangula* (Linn.) - Glossy Buckthorn  
*Rhamnus purshiana* (DC.) - Cascara sagrada  
*Rhododendron arborescens* (Pursh.) Sweet Azalea. syn. *Azalea obtusum*  
*Rhododendron vaseyi* (Gray) - Pinkshell Azalea. syn. *Azalea vaseyi*  
*Rhodotypos kerrioides* (Sieb.& Zucc.) - Jetbead, White Kerria. syn. *R. scandens*  
*Rhodotypos scandens* (Thunb.) - Jetbead. syn. *Rhodotypos kerricoides*  
*Rhus aromatica* (Ait.) - Fragrant Sumac. syn. *Rhus canadensis*  
*Rhus canadensis* (Marsh.) - Fragrant Sumach. syn. *Rhus aromatica*  
*Rhus copallina* (Linn.) - Shining or Mountain Sumac  
*Rhus cotinus* (Linn.) - Smoketree or Wig Tree. syn. *Cotinus coggygria*  
*Rhus glabra* (Linn.) - Smooth Sumac  
*Rhus javanica* (Thunb.) - Java Sumac. syn. *Rhus chinensis* (Mill.)  
*Rhus typhina* (Linn.) - Staghorn Sumach

*Ribes alpinum* (Linn.) - Alpine or Mountain Currant  
*Ribes aureum* (Pursh.) - Golden Flowering Currant  
*Ribes odoratum* (Wendl.) - Missouri or Buffalo Currant  
*Ribes sanguineum* (Pursh.) - Red-flowered or Winter Currant  
*Robinia hispida* (Linn.) - Rose Acacia, Bristly Locust  
*Robinia viscosa* (Vent.) - Clammy Locust  
*Rosa carolina* (Linn.) - Pasture Rose. syn. *Rosa humilis*  
*Rosa eglanteria* (Linn.) - Sweet Briar, Eglantine. syn. *Rosa rubiginosa*  
*Rosa hugonis* (Hemsl.) - Father Hugo's Rose  
*Rosa humilis* (Marsh.) - Pasture Rose. syn. *Rosa carolina*  
*Rosa multiflora* (Thunb.) - Japanese or Many-flowered Rose  
*Rosa nitida* (Willd.) - Bristly or Glossy-leaved Rose  
*Rosa rubiginosa* (Linn.) - Sweet Briar or Eglantine. syn. *Rosa eglanteria*  
*Rosa rugosa* (Thunb.) - Rugose Rose  
*Rosa setigera* (Michx.) - Prairie Rose  
*Rosa wichuraiana* (Crep.) - Memorial Rose  
*Rosa zanthina* (Lindl.) - Korean Rose or Double Hugonis  
*Rubus allegheniensis* (Porter.) - American Blackberry  
*Rubus flagellaris* (Willd.) - Dewberry. syn. *Rubus procumbens*  
*Rubus idaeus* (Linn.) - European or Common Raspberry  
*Rubus occidentalis* (Linn.) - Black Raspberry or Blackcap  
*Rubus odoratus* (Linn.) - Flowering Raspberry  
*Rubus procumbens* (Muhl.) - Cultivated American Dewberry. syn. *Rubus flagellaris*  
*Rubus strigosus* (Michx.) - Common Red Raspberry. syn. *Rubus idaeus strigosus*  
*Salix candida* (Flugge.) - Rosemary Willow. syn. *Salix incana*  
*Salix discolor* (Muhl.) - Pussy Willow  
*Salix humilis* (Marsh.) - Prairie Willow  
*Salix incana* (Schrank.) - Rosemary Willow. syn. *Salix candida*  
*Salix irrorata* (Anders.) - Colorado Willow  
*Salix lucida* (muhl.) - Shining Willow  
*Salix pentandra* (Linn.) - Laurel or Bayleaf Willow  
*Salix tristis* (Ait.) - Dwarf or Sage Willow  
*Sambucus canadensis* (Linn.) - Sweet Elder  
*Sambucus nigra* (Linn.) - European Elder  
*Sambucus racemosa* (Linn.) - Red-berried Elder  
*Shepherdia canadensis* (Nutt.) - Buffaloberry  
*Sorbaria sorbifolia* (A. Braun.) - Ash-leaved Spirea  
*Spirea arguta* (Zabel.) - Garland Spirea  
*Spirea bumalda* (Burvenich.) - Bumalda Spirea  
*Spirea prunifolia* (Sieb. & Zucc.) - Bridal Wreath, Plumleaf Spirea  
*Spirea thunbergi* (Sieb.) - Thunberg's Spirea  
*Spirea tomentosa* (Linn.) - Hardhack or Steeplebush  
*Spirea vanhouttei* (Zab.) - VanHoutte Spirea  
*Staphylea trifolia* (Linn.) - American Bladdernut  
*Stephenandra flexuosa* (Sieb. & Zucc.) - Cut-leaf Stephenandra. syn. *S. incisa*  
*Stephenandra incisa* (Thunb.) - Cut-leaf Stephenandra. syn. *S. flexuosa*  
*Symphoricarpus albus* (Blake.) - Snowberry. syn. *Symphoricarpus racemosus*  
*Symphoricarpus orbiculatus* (Moench.) - Indian Currant. syn. *S. vulgaris*  
*Symphoricarpus racemosus* (Michx.) - Snowberry. syn. *Symphoricarpus albus*  
*Symphoricarpus vulgaris* (Michx.) - Buckbrush. syn. *Symphoricarpus orbiculatus*  
  
*Syringa amurensis* (Rupr.) - Amur or Manchurian Lilac  
*Syringa chinensis* (Willd.) - Rouen Lilac  
*Syringa josikaea* (Jacq.) - Hungarian Lilac  
*Syringa pekinensis* (Rupr.) - Peking Lilac  
*Syringa persica* (Linn.) - Persian Lilac  
*Syringa sweginzowi* (Koeh. & Lingelsh.) - Chengtu Lilac  
*Syringa villosa* (Vahl.) - Himalayan Lilac  
*Syringa vulgaris* (Linn.) - Common Lilac  
*Tamarix gallica* (Linn.) - French Tamarisk  
*Tamarix parviflora* (DC.) - Tamarisk  
*Tamarix pentandra* (Pall.) - Five-stamen Tamarisk  
*Vaccinium angustifolium* (Ait.) - Lowbush Blueberry. syn. *Vaccinium Pensylvanicum*  
*Vaccinium corymbosum* (Linn.) - Highbush Huckleberry, Tall Blueberry  
*Vaccinium pensylvanicum* (Lam.) - Lowbush Blueberry. syn. *V. angustifolium*  
*Viburnum acerifolium* (Linn.) - Dockmackie or Maple-leaved Viburnum  
*Viburnum americanum* (Mill.) - Crampbark or American Highbush Cranberry

*Viburnum burkwoodi* (Burkwood) - Gardenia-scented Snowball  
*Viburnum carlesii* (Hemsl.) - Fragrant Viburnum  
*Viburnum cassinoides* (Linn.) - Withe-rod  
*Viburnum dentatum* (Linn.) - Arrow-wood  
*Viburnum lantana* (Linn.) - Wayfaring Tree  
*Viburnum lentago* (Linn.) - Nannyberry, Sheepberry  
*Viburnum nudum* (Linn.) - Possumhaw or Smooth Withe-rod  
*Viburnum opulus* (Linn.) - European Highbush Cranberry  
*Viburnum prunifolium* (Linn.) - Blackhaw or Stagbush  
*Viburnum sieboldii* (Miq.) - Siebold Viburnum  
*Viburnum tomentosum* (Thunb.) - Doublefile Viburnum  
*Weigela amabilis* (Hort.) - Rose Weigela. syn. *Weigela florida*, *Diervilla florida*  
*Weigela floribunda* (Sieb. & Zucc.) - Crimson Weigela  
*Weigela florida* (Sieb. & Zucc.) - Rose Weigela. syn. *Weigela amabilis*  
*Xanthoceras sorbifolium* (sorbifolium) (Bunge) - Chinese Buckeye or Flowering  
 Chestnut. syn. *Xanthoceras simplicissima* (Marsh.)  
*Xanthorrhiza apifolia* (L'Her.) Yellowroot  
*Zanthoxylum americanum* (Mill.) - Prickly Ash

#### VINES

*Actinidia arguta* (Miq.) - Silver Vine  
*Akebia quinata* (Decne.) - Five-fingered Akebia  
*Ampelopsis aconitifolia* (Bunge) Monkshood Vine  
*Ampelopsis brevipedunculata* (Maxim.) - Porcelain Berry. syn. *A. heterophylla*  
*Ampelopsis heterophylla* (Sieb. & Zucc.) - Turquoise Berry. syn. *A. brevipedunculata*  
*Ampelopsis quinquefolia* (Michx.) - Woodbine, Virginia Creeper  
 syn. *Parthenocissus quinquefolia*  
*Ampelopsis tricuspidata* (Sieb. & Zucc.) - Boston Ivy. syn. *Parthenocissus*  
 tricuspidata  
*Aristolochia durior* (Hill) - Dutchman's Pipe. syn. *Aristolochia siphonifera*  
*Aristolochia siphonifera* (L'Her.) - Dutchman's Pipe. syn. *Aristolochia durior*  
*Bignonia grandiflora* (Linn.) - Chinese Trumpet Creeper. syn. *Campsipendula grandiflora*  
*Bignonia radicans* (Seem.) - Trumpet Vine. syn. *Campsipendula radicans*  
*Campsipendula grandiflora* (Thunb.) - Chinese Trumpet Creeper. syn. *Bignonia grandiflora*  
*Campsipendula radicans* (Linn.) - Trumpet Vine. syn. *Bignonia radicans*  
*Celastrus orbiculatus* (orbiculata) (Thunb.) - Oriental Bittersweet  
*Celastrus scandens* (Linn.) - Bittersweet  
*Clematis henryi* (Anderson-Henry) - Henry Clematis  
*Clematis jackmani* (Th. More) - Jackman Clematis  
*Clematis paniculata* (Thunb.) - Japanese Clematis  
*Clematis virginiana* (Linn.) - Virgin's Bower  
*Cocculus carolinus* (DC.) - Carolina Moonseed  
*Decumaria barbara* (Linn.) - Decumaria  
*Hydrangea petiolaris* (Sieb. & Zucc.) - Climbing Hydrangea  
*Lonicera japonica* (Thunb.) - Japanese Honeysuckle  
*Lonicera sempervirens* (Linn.) - Trumpet Honeysuckle  
*Menispermum canadense* (Linn.) - Moonseed  
*Parthenocissus quinquefolia* (L.) Planch. - Woodbine. syn. *Ampelopsis quinquefolia*  
*Parthenocissus tricuspidata* (Sieb. & Zucc.) - Boston Ivy. syn. *Ampelopsis*  
 tricuspidata  
*Periploca graeca* (Linn.) - Silk Vine  
*Polygonum auberti* (Henry) - Silver-lace Vine  
*Polygonum baldschuanicum* (Regel.) - Silver Lace Vine  
*Pueraria thunbergiana* (Benth.) - Kudzu Bean  
*Schizophragma hydrangeoides* (Sieb. & Zucc.) - Japanese Hydrangea Vine  
*Smilax glauca* (Walter) - Cat-briar or Saw-briar  
*Smilax hispida* (Muhl.) - Green Briar  
*Smilax rotundifolia* (Linn.) - Horse Briar  
*Solanum dulcamara* (Linn.) - Deadly Nightshade  
*Vitis aestivalis* (Michx.) - Summer Grape  
*Vitis coignetiae* (Pulliat.) - Gloryvine  
*Vitis labrusca* (Linn.) - Fox Grape  
*Vitis vulpina* (Linn.) - Riverbank or Frost Grape  
*Wisteria floribunda* (DC.) - Japanese Wisteria  
*Wisteria sinensis* (Sweet) - Chinese Wisteria

## BROAD-LEAVED EVERGREENS

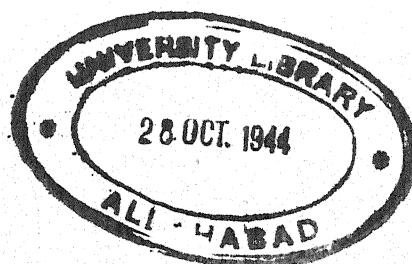
*Andromeda polifolia* (Linn.) - Wild or Bog Rosemary  
*Arctostaphylos uva-ursi* (Spreng.) - Bearberry, Kinnikinnick  
*Berberis neuberti* (Lem.) - Neubert Barberry. syn. *Mahoberberis neuberti*  
*Berberis mentorensis* (Wayside) - Mentor Barberry  
*Buxus sempervirens* (Linn.) - Boxwood  
*Calluna vulgaris* (Hull) - Heather, Ling  
*Chamaedaphne calyculata* (Moench.) - Leatherleaf, Cassandra  
*Chimaphila umbellata* (Nutt.) - Pipsissewa, Prince's Pine  
*Daphne cneorum* (Linn.) - Garland Flower  
*Epigaea repens* (Linn.) - Trailing Arbutus, Mayflower  
*Erica carnea* (Linn.) - Moor Heath  
*Erica cinerea* (Linn.) - Scotch Heath  
*Erica tetralix* (Linn.) - Cross-leaved Heath  
*Erica vagans* (Linn.) - Cornish Heath  
*Euonymus fortunei* (Turcz.) - Wintercreeper. syn. *Euonymus radicans*  
*Euonymus japonica* (Linn.) - Evergreen Burning Bush  
*Euonymus radicans* (Sieb.) - Wintercreeper. syn. *E. fortunei*  
*Gaultheria procumbens* (Linn.) - Checkerberry, Wintergreen  
*Hedera helix* (Linn.) - English Ivy  
*Ilex aquifolium* (Linn.) - European or English Holly  
*Ilex crenata* (Thunb.) - Japanese Holly  
*Ilex glabra* (Gray) - Inkberry  
*Ilex opaca* (Ait.) - American or Christmas Holly  
*Kalmia angustifolia* (Linn.) - Sheep-Laurel, Lambkill  
*Kalmia latifolia* (Linn.) - Mt. Laurel, Calico Bush  
*Kalmia polifolia* (Wangh.) - Pale Laurel  
*Ledum groenlandicum* (Oed.) - Labrador Tea  
*Leucothoe catesbaei* (Gray) - Drooping Leucothoe  
*Lyonia mariana* (Linn.) - Staggerbush. syn. *Pieris mariana*  
*Mahoberberis neuberti* (Baumann) - Neubert Barberry. syn. *Berberis neuberti*  
*Mahonia aquifolium* (Nutt.) - Oregon Grape  
*Pachistima canbyi* (Gray) - Ratstripper  
*Pachysandra terminalis* (Sieb. & Zucc.) - Mt. Spurge  
*Pieris floribunda* (Benth. & Hook.) - Fetterbush  
*Pieris japonica* (D. Don) - Japanese Andromeda  
*Pieris mariana* (Benth. & Hook.) - Staggerbush. syn *Lyonia mariana*  
*Pyracantha coccinea* (Roem.) - Scarlet Firethorn  
*Rhododendron catawbiense* (Michx.) - Rose Bay, Catawba Rhododendron  
*Rhododendron maximum* (Linn.) - Great Laurel, American Rose Bay  
*Viburnum rhytidophyllum* (Hemsl.) - Leatherleaf Viburnum  
*Vinca minor* (Linn.) - Myrtle, Lesser Periwinkle

## CONIFERS

*Abies balsamea* (Mill.) - Balsam Fir, Balm of Gilead  
*Abies cilicica* (Carr.) - Cilician Fir  
*Abies concolor* (Lindl. & Gord.) - White or Silver Fir  
*Abies Fraseri* (Poir.) - Fraser Fir or She Balsam  
*Abies homolepis* (Sieb. & Zucc.) - Nikko Fir. syn. *Abies brachyphylla*  
*Abies nordmanniana* (Spach.) - Nordman or Caucasian Fir  
*Abies veitchii* (Lindl.) - Veitch Fir  
*Cedrus atlantica* (Manetti) - Atlas or Algerian Cedar  
*Cedrus deodara* (Laws.) - Deodar Cedar  
*Cedrus libani* (Laws.) - Cedar of Lebanon  
*Chamaecyparis lawsoniana* (Parl.) - Lawson's Cypress. syn *Cupressus lawsoniana*  
*Chamaecyparis nootkatensis* (Sudw.) - Nootka Cypress  
*Chamaecyparis obtusa* (Endl.) - Hinoki Cypress  
*Chamaecyparis pisifera* (Endl.) - Sawara Cypress, Retinospora  
*Chamaecyparis thyoides* (Brit.) - White Cedar  
*Cryptomeria japonica* (D. Don.) - Cryptomeria  
*Cupressus lawsoniana* (A. Murr.) - Lawson Cypress. syn. *Chamaecyparis lawsoniana*  
*Cupressus macrocarpa* (Hartw.) - Monterey Cypress

*Cupressus sempervirens* (Linn.) - Italian Cypress  
*Juniperus chinensis* (Linn.) - Chinese Juniper  
*Juniperus communis* (Linn.) - Common Juniper  
*Juniperus excelsa* (Bieb.) - Greek Juniper  
*Juniperus horizontalis* (Moench.) - Creeping Juniper  
*Juniperus japonica* (Hort.) - Prostrate Juniper. syn. *J.chinensis japonica* (Carr.)  
*Juniperus sabina* (Linn.) - Savin Juniper  
*Juniperus squamata* (Buch.-Ham.) - Creeping Cedar  
*Juniperus virginiana* (Linn.) - Red Cedar  
*Larix europaea* (DC.) - Larch. syn. *Larix decidua* (Mill.)  
*Larix laricina* (K.Koch) - Tamarack, Hackmatack  
*Picea canadensis* (BSP.) - White or Canadian Spruce . syn. *P.glauca* (Moench.)  
*Picea engelmanni* (Engelm.) - Engelmann Spruce  
*Picea excelsa* (Link.) - Norway Spruce. syn. *Picea abies* (L.)  
*Picea mariana* (BSP.) - Black Spruce  
*Picea omorika* (Bolle) - Servian Spruce  
*Picea orientalis* (Carr.) - Oriental Spruce  
*Picea polita* (Carr.) - Tigertail Spruce  
*Picea pungens* (Engelm.) - Colorado Spruce  
*Pinus banksiana* (Lamb.) - Jack Pine or Scrub Pine  
*Pinus bungeana* (Zucc.) - Lace-bark Pine  
*Pinus cembra* (Linn.) - Swiss Stone Pine  
*Pinus flexilis* (James) - Limber Pine  
*Pinus montana* (Mill.) - Swiss Mountain Pine  
*Pinus mugo* (Turra.) - Mugho Pine . syn. *Pinus montana mugo*  
*Pinus nigra* (Arnold) - Austrian Pine  
*Pinus ponderosa* (Dougl.) - Western Yellow Pine, Bull Pine  
*Pinus resinosa* (Ait.) - Red Pine, Norway Pine  
*Pinus rigida* (Mill.) - Pitch Pine  
*Pinus strobus* (Linn.) - White or Weymouth Pine  
*Pinus sylvestris* (Linn.) - Scotch Pine  
*Pinus virginiana* (Mill.) - Scrub or Jersey Pine  
*Pseudotsuga douglasii* (Carr.) - Douglas Fir . syn. *P.taxifolia*  
*Pseudotsuga taxifolia* (Poir.) - Douglas Fir . syn. *Pseudotsuga douglasii*  
*Sciadopitys verticillata* (Sieb. & Zucc.) - Umbrella Pine  
*Taxodium distichum* (Rich.) - Bald Cypress  
*Taxus baccata* (Linn.) - English Yew  
*Taxus canadensis* (Marsh.) - American Yew  
*Taxus cuspidata* (Sieb. & Zucc.) - Japanese Yew  
*Thuja koraiensis* (Nakai) Korean Arborvitae  
*Thuja occidentalis* (Linn.) - Arborvitae or White Cedar  
*Thuja orientalis* (Linn.) - Oriental Arborvitae . syn. Biota  
*Thuja plicata* (Don.) - Giant Arborvitae  
*Tsuga canadensis* (Carr.) - Hemlock  
*Tsuga caroliniana* (Engelm.) - Carolina Hemlock

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